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By Stanley D. Bell

Other Science Stories In This Issue

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Publication Office, 404 North Wesley Ave., Mt. Morris, Ill.
Editorial and General Offices, 96-98 Park Place, New York City

Vol. 3, No. 8 **JANUARY, 1932**

Published by
STELLAR PUBLISHING CORPORATION
H. GERNSBACK, Pres. **S. GERNSBACK, Treas.** **I. S. MANHEIMER, Sec'y.**

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NEXT MONTH

"A CONQUEST OF TWO WORLDS"

by **Edmond Hamilton**

Just as the white man has nothing to be proud of in his early conquest of the Americas, so the human race will hardly look back with pride if it manages to conquer the solar planets. The dominating force of greed is not expected to suddenly vanish when enterprising men roam the interplanetary spaces.

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"THE CHALLENGE OF THE COMET"

by **Arthur K. Barnes**

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In this story we get a flashing insight into a recent disaster that horrified the whole world a year ago and still mystifies it. Mr. Barnes tells us in his own realistic way some of the extraordinary possibilities that may lie behind such disasters.

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Address all contributions for publication to Editor, WONDER STORIES, 96-98 Park Place, New York. Publishers are not responsible for lost MSS. Contributions cannot be returned unless authors remit full postage.

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JANUARY
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On the other hand, if there was no space at first, and there was no matter, this, to us, makes no sense either. What, then, is the solution?

It would seem that, in later researches, it may be found that you cannot have space without matter, nor matter without space; and, as a matter of fact, we will probably find that the two are one and the same thing.

I advance this as a new concept, paradoxical as it may strike one at present. But I feel certain that in the future the idea may not appear so absurd as it does now. Increasing knowledge will take care of that.

"Pure" space is possibly some thing that we on earth cannot contemplate and we cannot understand it because no one on earth has ever seen it. There is no way of manufacturing on earth space that is anywhere near "empty." The best and most efficient vacuum we can produce on earth still contains a tremendous amount of matter; and so, of course, does universal space, although the vacuum there is very much better than anything we can create in our laboratories today. But even here, space still contains matter and matter still contains space, no matter how complete the vacuum. Even if we could have a portion of space in the remotest corner of the universe denuded of the last electron, it still would not be empty, for it still would abound with *radiation*.

And this is where the crux of the whole matter lies. In the word "radiation," future scientists will no doubt find most solutions of the present space-matter puzzles; for, in the last analysis, it probably will be found that some unknown radiation in reality is the primeval substance of matter. It makes no difference that we do not know much about this cosmic radiation today; whether the radiation is light or whether it is a type of cosmic ray of which little is known or some other form which has, as yet, not been conceived because it has not been discovered. In fact, it is now conceivable that primordial space is but a form of radiation itself. If we follow this train of thought, much that may have been incomprehensible to us before becomes a little clearer. The concept also fits in better with our ideas of infinity in general.

Another important point that I wish to make is that the space-radiation concept will give us a better substitute for the new almost universally discarded ether.

Of course, the real physical properties of this space-radiation will not be known for perhaps many years; because, as yet, we have not the knowledge nor the instruments to make the necessary physical tests. Ten years ago, no one suspected the existence of cosmic rays. Today we recognize them because we have physical proof of their existence. It may be so with the unknown radiations created by space itself, and which no doubt make up and permeate the entire universe.

MARTIAN GUNS

By STANLEY D. BELL

(Illustration by Paul)

Not hesitating they leaped on and on. Like winged creatures they soared over the heads of the stolid Martians.

MARTIAN GUNS

STANLEY D. BELL

OCCASIONALLY there comes a story that for sheer realism, for exciting plot and for breath-taking description is lifted into a superior class. This story, we think, falls in that category.

Although our earth may seem to us to be isolated in the heavens, an island in space, we are yet part of innumerable stellar systems and universes. Like a grain of sand on the seashore we are subject to the multitude of forces that make up the cosmos.

Even more, we are open to attack by any alien form of life that may exist and cast greedy eyes upon our green earth. For there is no doubt but that our planet, for organic life at least, is quite blessed in its physical condition. Life on earth is much easier and much richer than it could possibly be on Mars, Mercury, Venus or in fact any of the other solar planets.

If other intelligent organic forms of life exist in the solar system, the lure of the earth must be always before them, and if the pressure of conditions on their own world was strong enough, they might risk everything in a gamble to conquer our planet. Our author has indulged in no impossible fantasies in the writing of this breath-taking story, that rises to such an overwhelming climax.

THE thunderous roar from the crowd was suddenly silenced as Halliday closed the ports of the space ship, effectively sealing the crew of the *Flame* from the outer world. Jeers, epithets of ridicule, and great rousing cheers that had been flung through the port were alike shut out from metal walls of this human prison, as the first space ship prepared to ascend into the great void.

Halliday, lean, serious faced, but of a commanding presence, turned to face the anxious little group of his passengers—who were to share this great adventure. Parker, Benedict, Perkins, Clayton, Morse, Landay; he counted them off. Then suddenly he looked about . . .

"Where's Vincent?" he asked quickly.

"Gone to the pump room to look over the apparatus," Morse, the little ship's cook, replied timidly.

"Very well, take your posts."

At Halliday's words, the six men silently strapped themselves into the deep-cushioned hammocks that lined the walls of the control room. Halliday, his face puckered into a frown, tested the gauges of the massive control board; glancing nervously at the electro-chronometer above his head.

"Eight minutes more," he grunted. Moving nervously to the porthole, and removing one of the quartz windows, he peered into the dusk across the great field, to where massed thousands stood waiting for the *Flame* to go roaring heavenward.

The labor, the turmoil, the anxiety of the building and testing of the ship was over, only to have the great gamble with cosmic forces begin. The chances were dead against them. Even though they survived the terrors of space and landed on the moon, there was the moon menace to face . . . but he preferred not to think about that now.

He wondered what those hordes of people were thinking about him and his crew. The world had poured enough ridicule onto the expedition to fill an ocean. Fools, they would laugh! They would have laughed harder had they known why the eight men of the *Flame* were risking death or worse in this stupendous journey. It was for their sake, the sake of the laughing fools, that all this had come about. . . .

Impatiently he closed the port to shut out the vision of the sea of human forms. Screwing the port tight, he turned again to face the members of the crew who were watching him intently from their hammocks.

Their lives were in his hands now. Once the journey started, the least twitch of a lever, a momentary inattention, his failure to retard the ship's plunge through space, any one of a dozen things, might mean the end of them all.

Turning away from their penetrating looks, he consulted his charts for the last time, and then took up a phone near his unoccupied hammock. Plugging in he heard an answering muffled voice.

"Vincent speaking."

"Halliday, Vincent. Aren't you coming back here, man? We've got to get started."

"Start then," came Vincent's laconic answer. "I'll use the emergency bunk here and see you when we get into space."

Halliday mumbled a reply, and opening the straps of his hammock, slid himself into its cushioned depths. Tightening the straps, he tested his position and the freedom of his arms to reach the gleaming brassy dials and levers at his side.

Adjusting the vision of the periscope before him that was to give him view of the earth, Halliday drew a deep breath and settled back.

The moment of the start was at hand, the labor of years was poised on this instant, as he narrowly watched the chronometer. And precisely as its single hand registered the hour of eight-thirty, Halliday unhesitatingly drew back the starting lever to the first notch.

As though catapulted from a great gun, he felt himself, his fellow passengers, his whole ship blown upward into emptiness. With an unseen weight pressing on his chest, he threw the lever into the second notch, . . . then the third . . . the fourth . . . relentlessly shooting into the giant rocket tubes at the ship's tail, the gases of combustion that were severing the earth's grip on them.

Hardly breathing now, from the unbearable weight on his body, conscious of the muffled groans and sobs of his crew, Halliday grimly pulled the lever to the final notch, throwing into the gamble with the earth's pull, the maximum of his available power. The dials above his head that registered the velocity of escape from the earth, still fell short of the thin red mark that meant successes. Either the red mark must be covered, or slowly, surely the earth's pull would draw them back . . . back until they crashed, a lifeless wreck on the earth's surface. With a painful effort, summoning every ounce of his strength, he thrust the lever home, until the arrow of the dial crept doggedly to the red line and hung there.

Exhausted, bathed in a cold sweat, Halliday sank back into the hammock. Spots danced before his eyes—red, and vividly green; the cabin swirled and gyrated; crazy figures filled his brain, and at last with a grim smile of satisfaction he drifted off into a deep cool oblivion.

AS HALLIDAY, and his comrades, lay wrapped in a stupor of unconsciousness, exhausted by the rigors of this battle with brutal nature, some inquiring interplanetary creature might have wondered at the curious forces that had brought these diverse men together on a hazardous journey into the unknown.

There they lay, white-faced, lifeless—still, clutching with frenzied fingers the sides of their hammocks. Six men, from every walk of life, united in an adventure that had excited the ridicule and the grudging admiration of the world.

There was Halliday himself, resting lifeless in the space ship that was the result of the dream of his father and himself. The work on which the elder Halliday had spent his life—sheets of blueprints embodying a genius of inspiration for the building of an interplanetary vehicle—had been taken up by the youth and vigor of his son David, when the old man passed on. David like his father, had met sneers and incredulous faces in his years of search for the wealth that would translate a confusion of lines and symbols into a metal monster of giant power. And only the strange accident of fate that had brought Halliday into the secret of the moon menace, had made the ship possible.

It was Halsey Benedict, lying with closed eyes and mouth agape at Halliday's right, who had staked his fortune on this strange adventure. Benedict, man of the world, captor of feminine hearts, the sportsman who had stated publicly that "the earth had no more thrills for him," now lay helpless, in the lap of venture beyond anything he had dreamed of.

Except for Floyd Parker, former assistant astronomer at the Kingsley Observatory, the rest of the crew were a strange assortment of men, drawn together from the accidents of life, by the magnetism of a great undertaking. These men were Halliday's choice—of the thousands who had come to him—whom he believed he could depend upon in the crises they were certain to face.

There was Perkins, who had admitted having served a jail sentence for robbery, but who was a genius at mechanics; big Rob Clayton, crack aviator, with his hunted look of some crime he was trying to expiate; little Morse, ship's cook, who had protested to Halliday that he would rather face the dangers of space than the wife from whom he had three times fruitlessly run away; Ken Landay, former interne, who looked as though the world had gone sour on him; and Vincent who had demanded and been paid his own price as the compensation for risking his life, "on this fool thing."

Except for Vincent, hidden away now in the depths of the ship, the six men struggled to release themselves from the pit of unconsciousness into which they had fallen. And enclosing them like a steel coffin, the *Flame,* three thousand miles from the earth, sped in utter silence through the mystery and infinity of interstellar space.

CLAYTON was the first to awaken. He groaned softly, strained against the creaking straps and opened startled eyes. Stretching his great arms, he looked about him, and then realizing suddenly the meaning of the silence in the metal-walled cabin, he unbuckled the straps. With precision he put on the metal shoes, and testing cautiously the floor to make sure that it had been magnetized, he walked unsteadily to the still motionless form of Halliday. Gently he rubbed Halliday's white temples until a flicker of life showed itself in the unconscious man's eyes.

All over the cabin, the men were drifting back to awareness. Halliday sat up and gazed at Clayton gratefully. The latter nodded silently and went back to his own bunk. Halliday squinted at the velocity dial thoughtfully for a moment, then satisfied, he turned to the others.

"Everyone all right?"

"Righto."

"You bet."

"We're all here. . . ."

Halliday grinned and then turned to the periscope. Like a mottled vaporous-rimmed ball, he saw the earth floating in a sea of ink. "Come here, you explorers," he called to the others, "and see your former home."

As the men crowded about, Halliday suddenly bethought himself of the absent Vincent.

"Look after things, Clayton," he called to the former aviator, "I'm going to take a look around."

Clayton nodded as Halliday, already at the door, opened it and strode down the narrow metal aisle to the apparatus room. He thrust open another door and emerged into a room with great swollen veins of pipes ridging the ceiling. Near the instrument board that filled one wall, he saw the still unconscious form of Vincent on the emergency hammock.

But even before he reached the man, he stopped startled. This was not Vincent. . . . He rushed to the side of the hammock, and stood there thunder struck. . . . With peaceful face, eyes closed, and full lips dry and cracked, lay the girl who had so aroused his enmity through the preliminary stages of the expedition, Nina Wingate!

He thrust open the door, and called down the aisle. "Parker, Parker!" It was Parker's job, this, to attend to her. The effeminate-looking Parker was the one who had always been mooning about her, fighting for her favors. Now let Parker have the distinction of reviving her, he thought grimly.

Halliday was angry at this final trick of Nina's, so angry that when Parker rushed anxiously into the room, he pointed to the lifeless form carelessly. "You might take care of her, Parker," he said to the astonished astronomer. Then he strode from the room.

Halliday drew Benedict aside on returning to the control room. The latter once more at his composure—aristocratic, distant, aware of his handsome, distinguished features, looked at Halliday quizzically.

"Miss Wingate is our passenger," Halliday whispered.

Benedict mastered his surprise admirably. Then he permitted himself a low chuckle. "Eight men and a woman," he said significantly.

"Seven men," Halliday grunted. He saw the explanation now. Vincent, the mercenary cuss, had sold himself out. That must have been the meaning of the little whispered conversation that he had interrupted on coming upon Vincent and Nina one day in the great construction shed.

"See what you can do, will you?" Halliday said softly to Benedict. "But don't interrupt any love scenes."

Benedict gazed intently at Halliday for a moment, and then nodded, going toward the door.

Halliday turned his attention to the dials. So far, the ship had passed the eight thousand-mile mark on its 240,000 mile journey to the moon. Through the periscope he saw the earth shrinking like a gently deflated balloon.

Morse had already disappeared into the galley to prepare the first meal in space. Landay and Clayton, who had struck up a close friendship, were together peering from the single port that gave view into the great spaces.

"Anything I can do, sir?" Perkins asked.

Halliday shook his head. He had a deep affection for the little runt, this ex-jailbird whose ingenuity had helped him over many tight places in the building of the ship. He patted the man's shoulder.

"Get some rest, Perk," he said. "The hard work is coming soon enough." And taking up his mass of diagrams that were to be the guiding curves of the flight through space, Halliday buried himself in plans for the next step in their battle to reach the moon.

Two hours had passed, the earth retreating ten thousand miles into its background of velvet, before Nina appeared from her seclusion.

The crew had meanwhile settled down to its routine. Perkins was busy inspecting the apparatus in the place of the missing Vincent; big Clayton was navigating the ship according to the charts Halliday had checked, Landay was writing the ship's log.

Benedict had easily accustomed himself to the confinement of the ship and its lack of luxury. For the past hour he had been regaling to the open-mouthed Morse, some of the more juicy of his stories of conquests of women and tigers.

Parker was busy at the little telescope, watching for signals from the earth, that might indicate that they had been sighted, when Nina walked into the room and strode up to Halliday.

"Well, I'm here, captain," she said graciously.

Halliday, who had expected that she would present herself shamefacedly, was nonplussed for a moment. Then his indignation found expression.

"Aren't you a bit ashamed of yourself? You've nearly ruined our plans."

Nina smiled captivatingly. "Oh no I haven't. You know, I told you before we left that I could do anything that your men could. But you simply wouldn't let me come . . . and I came."

Halliday was forced to admit that Nina was right in her statement that she could do a man's work. She was both astronomer and mechanic. But she should not have been here, and he told her so flatly.

But while the men looked on this little scene with surprise and then amusement, Halliday suddenly dismissed the incident from his mind. After all, there were more important things to be considered.

He looked about at the men. With the exception of Benedict and Parker—and now Nina, none of them knew the reason for this journey. All believed, as the world did, that it was a space expedition—simply an attempt of a band of brave and foolish men to reach our dead satellite.

"Men," Halliday said sharply. They looked at him.

"I've got a little story to tell you," he continued. He turned to the former aviator. "Will you stay at the controls, Clayton, you can listen just as well that way." Clayton nodded dumbly, as questioning looks were flashed from man to man. Had something gone wrong? Were they turning back?

"I've got a story to tell you," Halliday went on, "that may strike you as a bit crazy. Maybe it is crazy, personally I don't know. But we're on our way to find out.

"This trip, men, is no mere space expedition. It has behind it a more important purpose, a rather sinister purpose I might say."

CHAPTER II

An Unbelievable Story

HE PAUSED a moment as startled expressions passed over the faces of his listeners. Only Nina, gazing at Halliday with softened eyes, and Parker and Benedict, wore understanding looks. But in Parker's face there was also derision and scorn, that Halliday did not fail to notice.

"I know you don't believe in this, Parker," Halliday answered his look. "But we'll all soon find out what the truth is. Men," he said suddenly, "we are going to the moon to discover if there is not there a colony of Martians determined on wiping our race from the earth."

Clayton at the controls sucked in his breath audibly, glancing meanwhile at the white-faced Landay. Morse tittered nervously, while Perkins gazed open-mouthed at his chief.

"Don't look at me that way," Halliday went on, "I'm not mad. There is certain evidence that the astronomer of the Kingsley Observatory, Miss Wingate's father, has collected that has convinced him and nearly convinced me, that there is a colony of Martians on the moon, and that they have already begun a bombardment of the earth."

And while the little group of men, and a single woman listened in their little metal prison to this most amazing of stories, the ship cut its way through the nothingness that separated earth from its satellite, drawing nearer and nearer to the half-illuminated lunar face.

Quietly now, Halliday recounted the series of incidents that had led to the building of the *Flame*.

He told how his father's friend, John Wingate, elderly astronomer of the great Kingsley Observatory had invited him one day to view an early autumn full moon through the marvelous new lens that Wingate's genius had devised. And when Halliday had gazed his full of the jagged, pitted lunar surface, Wingate had taken him aside and told him the amazing story that was the reason for this expedition.

It had bowled Halliday over. Even his own plans for a space ship, that he believed would be the first successful ship to conquer the interstellar void, were thrown into insignificance by this astounding news of a threat to the earth by an alien force.

Patiently Wingate had explained how four years ago at the last opposition of earth with Mars, when the planets were closest, he had seen near the lunar rim flashes of light, that might have come from the reflection of the sun on metal surfaces. Observing the moon two days later, Wingate had perceived minute changes on the moon, near the center of the crater of Archimedes. The changes could be interpreted only as some strange lunar activity. Then abruptly all activity had ceased. It was only after observing the moon fruitlessly for two years, in fact until the next opposition of Mars, that Wingate had had an opportunity to test a theory of his that was so startling as to make him question his own sanity.

To his astonishment, almost to his incredulity, he had observed one night, as Mars and earth swung closer together again, a new series of light flashes near the moon. But whereas before there had been a half dozen, now Wingate had distinguished almost a hundred. And following this there had come renewed evidences of some changes in the crater of Archimedes.

This was the first part of the story that Wingate had told to an astonished Halliday two years ago. And Halliday, despite his eagerness to find support for the building of the space ship, and despite his own open mindedness, had not dared to ask the old astronomer his conclusions. But Wingate had himself advanced them. He had brought out of a drawer a two-inch sliver of a bluish metal and placed it before Halliday.

"This," Wingate had said, "was what I found when I investigated the site of the meteor that fell in Kansas last week."

The meteor had excited considerable attention when it fell flaming through the heavens to settle, incandescent in a lonely Kansas plain. Astronomers had hastened there, and among the first to reach the spot had been Wingate. The meteor, almost twenty cubic feet in volume, had plowed its way deep into the earth. And while astronomers planned to rescue it for our museums, Wingate, excited by something strange in the wanderer, had searched about in the neighborhood for something that he believed would be found. And this piece of blue metal was his reward.

Several weeks of feverish calculations followed for the old astronomer. When at last he had finished, he announced to Halliday and Parker his belief that the meteor was a shell thrown at the earth by a gigantic gun on the moon; and that the assailants were from the planet Mars.

Despite Parker's disbelief and Halliday's half-hearted support, Wingate had used his reputation to persuade the president of the United States to send a committee to investigate what he said was a "serious occurrence."

But the committee had gone away jeering, open contempt for Wingate's sanity written on their faces. The belief in another form of life traversing the distance from Mars to the moon, building a gigantic cannon there and bombarding the earth, escaped their entire range of ideas. It was not long afterwards that an attempt had been made to force Wingate out of his post as director of the Observatory; and only Wingate's promise to remain silent about the affair caused the release of pressure against him.

So the matter had rested until Nina, Halliday admitted grudgingly, had brought it to the attention of the enormously wealthy Benedict. And Benedict, carelessly handing over half of his fortune for the possibility of a new thrill, had made the building of Halliday's ship possible.

"So that is the story," Halliday finished. "Our journey is an attempt to discover the meaning of Wingate's phenomena. If he is right, and there are creatures on the moon that can bombard the earth, then it's goodbye human race. If not, then . . . " he finished expressively, "we will have had a pleasant journey."

THE absolute incredulity in the faces of Halliday's listeners had been changing, as he went on with his story, to looks of suspicion. When he finished, the men exchanged uneasy glances, as though to determine what could be done, on this speeding island in space, controlled by an apparent madman. Even little Perkins showed his wavering loyalty.

Nina, sensing the hostile reception Halliday's story had met, broke the silence. "It's all quite true what Mr. Halliday has told you. My father believes there are Martians on the moon; and I believe it too," she finished defiantly.

"Your beliefs are not important to this expedition, Miss Wingate," Halliday said sternly.

"I say . . . " Parker began in protest.

"No need to, Parker," Halliday interrupted. "I am in command of this ship." He turned to the men. "Now men, perhaps I have done you an injustice by taking you on a journey whose purpose you did not know. But secrecy was absolutely essential, and this is the first chance I've had to tell you the story. If any of you don't care to be exposed to the dangers we will meet, just speak up, and I'll provide safety for you."

There was silence in the cabin. Then Benedict spoke with his easy assurance. "You know we're with you to the end, Halliday."

"Me too," said Perkins, blushing.

"I'm in," growled Clayton.

"Don't leave me out, sir," chimed in Morse.

"Count me in," Landay said quietly.

All eyes were turned toward Parker, who had been silent.

"Of course, I want to do my share," he stammered. "But I think the whole thing is a wild dream," he added, glaring at Halliday.

"Now, Floyd," Nina said soothingly. "We're in this thing to stay. Let Mr. Halliday work it out his own way. Of course," she addressed Halliday, "I want you to consider me as one of the men."

Halliday ignored her. He glanced at the dials that registered the distance from the earth and moon.

"Now, men," he said quietly, "there's nothing to be concerned about until our landing on the moon, in fourteen hours. By that time I will have plans already made for the next step."

The men dispersed to their hammocks, and to their several duties. Halliday went back to his charts.

So the next hours passed by, the absolute silence of space unbroken. In a motionless universe the *Flame* seemed afloat in emptiness, no sense of her speed conveyed to those within her walls. Only the gradually expanding ball of the moon far ahead and to the right, gave evidence that they were slowly approaching their goal.

There was however about the men, a new nervous tension, a waiting for the approaching test with some monstrous force. Several times, Perkins hesitantly approached Halliday to question him more in detail about the supposed bombardment.

The hypothesis of a gun bombarding the earth from the moon, fascinated him most.

"A gun to shoot 240,000 miles, golly," he moistened his lips. "It can't be."

Halliday smiled. "It's not so hard to understand, Perkins. You see the moon has only one-sixth the gravitational pull of the earth. And whereas it would take a muzzle speed of some 7 miles a second to fire a projectile from the earth to escape to the moon, to hit the earth from the moon you need only a little over a mile a second. The German gun that bombarded Paris in 1918 could almost have done the trick."

"But how can they aim to hit the earth?" Perkins protested. "It ain't a big target for a 240,000-mile shot."

Halliday frowned suddenly. "As a matter of fact, Perk, they couldn't miss us. If the shell comes at all within the gravitational field of the earth and its speed is less than 7 miles a second, it will be pulled to the earth. A hit every time."

Perkins turned away, and Halliday noticed that for the remainder of the journey, the little mechanic was deeply absorbed in thought.

IT WAS during the twentieth hour of the flight that the first interruption of the progress to the moon threw the crew of the *Flame* into a panic. It was becoming evident as the hours passed that the sense of confinement in the vessel was reacting upon the men's nerves, Parker's especially. Walking nervously up and down the little control room, occasionally mumbling to himself, he served to increase the sense of an impending tragedy.

Benedict, finally exasperated, asked the man point blank: "What's eating you, Parker?"

"Eating me," he flashed back. "This whole idiotic journey. Here we are, nine crazy fools in this prison, at the mercy of every force in the universe. If there's nothing on the moon, we might crash there and die miserably. If there are some creatures, what's to stop them from spotting us here in space and using their gun on us?"

This possibility had not occurred to the men. It seemed to strike them forcibly.

Finally Perkins sneered. It had become evident that no love existed between him and Parker, who had referred to him as the "jailbird."

"So you're gettin' to believe in the Martians, Mr. Parker?"

Halliday quieted the man sternly, and gradually the incident was forgotten. But the effect upon the men's minds was clearly evident in the haggard lines of their faces. As Benedict put it, "it reminded me of the fellows chasing through a sub zone, in the days of our fathers, waiting to be torpedoed at any minute."

To men expecting that anything might happen, an event occurring less than an hour later threatened to throw them into a virtual panic.

The cabin was abnormally quiet at the moment. Halliday was at the controls; Parker at the telescope; Nina was gazing longingly through the periscope at the receding earth, while Benedict, Morse and Perkins in one corner and Clayton and Landay in another were holding quiet conversations.

Suddenly the silence was broken by a shriek from Parker.

"My God!" he screamed, "here comes a shell!"

The men jumped up in alarm, as Parker rushed wildly upon Halliday and jerked his arm. "Turn the ship, get out of the way," he beat upon Halliday hysterically, "it's coming, a shell, a shell!"

Halliday had no chance to shake off the fear-crazed man when there came a sudden terrific clang, as though the mighty hammer of a Titan had beaten upon the ship's metal hull. The ship careened violently, the men being thrown forcibly to the floor. There they lay stunned, hardly breathing, as the terrific vibrations of sound set up by the concussion pounded deafening on their ears.

Parker was the first to recover. He jumped up and dashed toward the controls, "I'll turn the ship. We're lost," he screamed.

Halliday sprang toward the man, and yanked him backward, and then beating his fist into the man's face, sent him flying to the floor where he lay still.

It looked as though the crew had been turned mad by this episode. Only Nina lay unmoving, still on the floor where she had fallen.

Halliday swung upon them. "Keep your senses, you fools," he shouted. "That was only a meteor."

The men looked at him glowering.

"It was only a meteor, I tell you," he repeated. "If that was a shell we'd all be dead now."

"They'll get us the next time," Morse snarled, panic-stricken. "Let's turn about."

"We can't turn," Halliday took a threatening step toward him. "If we're going to be killed, we'll get it sooner turning around. We've got to keep on."

Clayton came to his rescue. "Halliday's right, we've got to keep on."

Benedict had bent over the unconscious form of Nina and was lifting her to a cot. The sight of the girl quieted the men temporarily. Halliday, with sudden determination, turned toward the room where the ship's stores were kept.

Benedict looked up from his ministrations of the awakening girl.

"Where are you going, Halliday?"

"I'm going outside the ship to investigate," Halliday returned.

Nina suddenly became alive. She tried to elude Benedict to leave the hammock. "Don't go," she turned pleadingly to Halliday, "you'll be killed."

Halliday turned on her in amazement. "Nonsense," he laughed harshly, "I'm taking a space suit. Watch the controls, Clayton. Landy, let's have some of your medical ability in bringing Parker around. Perkins, you prepare the airlock."

He disappeared, while the men hastened to fill his orders. In five minutes he returned, a bulging grotesque figure of metal. Only the glass plate of the eyes gave evidence that it was a human being and not some monstrous planetary creature. He waved heavily a thick metal arm to the men, as Benedict restrained the struggling Nina to prevent her from rushing to Halliday.

Perkins, working at the controls of the inner airlock, had already swung open the door, exposing a small metal compartment, barely large enough for a metal-encased man to stand. Halliday stepped in unhesitatingly and Perkins closed the door behind him. In a moment there came a flash of light from a bulb at the airlock control board, signifying that Halliday was ready to be released into space.

Pulling back a lever, Perkins shouted, "There he goes!"

HALLIDAY'S first sensation as the outer door of the lock opened, was an overwhelming giddiness. He looked out into an unfathomable black abyss, where an uncountable distance away dead stars shone unblinking. For a moment this depth seemed like a bottomless well into which he would fall to certain destruction should he take a step forward.

Giving a little laugh of defiance in his metal helmet, he gently placed a foot into the void, and then swinging his body on an axis turned abruptly so that he faced the ship. Then flashing the searchlight integral with the space suit, on the ship's metal hull, he found the row of rungs that was to guide him over the ship's exterior.

The sound of the collision had come apparently from near the ship's nose. Gripping each rung carefully, he moved through the blackness, playing the light ahead of him, exploring each inch of the smooth, metal expanse.

Above the hull and to the right, he caught a glimpse of brightness. Raising his head cautiously he perceived with wonder the half-lighted ball of the moon, its seas and craters etched sharply in the sun's pitiless light.

For a moment he stood there, alone in the infinite, looking down upon that globe that held the menace of extinction to his race. Then shaking off his mingled feeling of wonder, awe and fear, he continued forward.

With a sudden exclamation, he played his light ten feet ahead, where the smooth surface was dented. Crawling forward hastily, he examined the eight-inch depression and discovered that the metal of the exterior hull had been crushed as if by a smashing blow.

The interior hull, separated from the exterior by a vacuum, was still undamaged. Halliday chuckled to himself. There was no doubt in his mind that it had been a meteor, perhaps six inches in diameter, that Parker had perceived bearing down on them. Because of the sun's glare on it, Parker's fear-mad mind must have enlarged the vision to that of a gigantic shell, bearing death to them.

Giving a final look around, and satisfied that the hull remained otherwise intact, Halliday started the painful return. He had been out four minutes now. But an eight minute's supply of oxygen remained in the temporary container he had snatched up in his haste.

Halliday never knew exactly how the accident happened. Perhaps it was a growing sense of giddiness, or maybe a slight exhaustion, or perhaps a too rich oxygen mixture in his helmet, that caused him to lose his grip on the rungs. But he knew that a sudden dizziness came over him, and to ward off an impending faint he raised his body from the crawling position. In doing so he may have released his hold upon the rungs, and involuntarily kicked his leg against the ship. For suddenly he saw the ship swiftly move away, and he found himself floating in emptiness.

Moving at an angle to the ship, he saw it quickly retreat into the void, growing smaller perceptibly before his eyes. It had happened with such suddenness that Halliday was stunned. Then panic filled him. He kicked his legs violently, shouted into the disc phone, that he knew was not connected with the ship, paddled with his arms against the empty void. Smaller and smaller was the speeding *Flame*, as the minutes passed. Waves of despair passed through the doomed man as he sensed the thinning supply of his oxygen, and the unaccustomed heat of the sun began to penetrate his metal casing.

His pulse beat like pounding hammers; it seemed in his feverish brain that Martian devils were pounding upon his suit with red hot hammers, tearing away his protecting armor. He found himself immersed in a vat of boiling iron, which hissed and ate at his defenseless body . . . he fainted . . .

He came back to slow awakening still struggling, to find blurred faces about him that he recognized as his comrades. The mist cleared, and drawing painful breaths of air, Halliday looked about. In the next hammock sobbing he saw the slender form of Nina Wingate, and above her Parker, trying vainly to soothe her.

Halliday relaxed. "So I'm alive!"

"Miss Wingate's work, you know," Benedict, looming above him, put in.

Halliday struggled to sit up. "Miss Wingate?"

Landay eased Halliday back into the hammock. "Better lie quietly awhile. Yes, Miss Wingate, watching at the port, saw you drift away from the ship, and when we turned about to get you she insisted on going out after you. She slipped on a space suit, grabbed a reaction pistol and found you floating unconscious. Plucky girl."

"Right," boomed Clayton. "The rest of us were scared stiff."

Halliday laughed weakly. "Rescued by a girl." He dropped off to a restful sleep.

CHAPTER III

Hostilities!

AS THE moon swam closer and closer, its bulk swelling in the heavens, the excitement of the little group in the *Flame* mounted proportionately.

The new and unaccustomed sights of the heavens threw into the background temporarily the terrible secret that the moon might hold. For hours the eight explorers would take turns in gazing at the receding ball of the earth through the periscope, and then through Parker's telescope at the onrushing moon.

Then the possible menace of the moon, and the memory of the narrow escape of their commander, would rush down upon them, and they would fall into moods of depression.

Halliday, as he prepared for the time of the landing, looked upon Nina with a new wonder. Determined, since he was a boy, upon the one mission of his life, he had rigidly excluded women from his thoughts. They were, he had believed, simply a weakening influence upon a man who had something important to accomplish. And Nina, despite her penetrating intelligence, had been to him simply a member of her sex.

Now he was forced to look upon her in a new light, as the savior of the expedition. To his thanks, Nina had hardly replied, and in the hours since the accident she had practically avoided him for Parker's and Benedict's company.

As the time came when the ship, plunging moonward, had escaped to the moon's gravitational influence, Halliday had completed his plans which he announced to the men.

They were to land in a part of the crater of Archimedes sixty miles to the west of where the Martian encampment was believed to exist, where a range of mountains would hide them from view. They would then divide into two search parties to reconnoiter the land. Benedict was to lead one party, with Perkins and Morse; he himself would take the other with Clayton and Landay. Parker and Nina would remain with the ship.

Parker could not conceal his relief; but Nina made protest at once.

"I object," she said disdainfully. "I insist upon accompanying one party."

"But Nina," Parker broke in . . .

"I insist, I say," she silenced him. "If you don't allow me to go with you," she said to Halliday, "I will go out alone."

Halliday bit his lip. She was openly defying him . . . but after all he owed her his life . . .

"Very well," he agreed. "You can come with me. Landay, will you remain with Parker?"

"I would rather remain with Clayton," Landay said slowly.

Nina looked squarely at Parker. "Don't you go with us, Floyd?"

Parker looked at her, guiltily, and then lowered his head. "Very well."

And so it was agreed.

At ten thousand miles from the moon, intent observation of Archimedes was begun. Although Parker declared that he could see nothing in the small-powered 'scope to give any signs of activity there, Halliday declared that he himself had visioned a faint checkerboard series of squares that almost filled the crater. The others who took turns at the telescope were divided in their views. It was agreed that they were still too far away to see distinctly.

Five thousand miles away, the moon swelled to fill the heavens and the ship's course was turned toward an angle with her path. The ship, minute in its comparison to the Juggernaut satellite, swung through the void. Its rocket tubes beat furiously their silent song of power, as its course was delicately adjusted by the intent Halliday for a safe landing.

With Parker observing their position through the telescope, and Perkins calling the readings of speed and power from the dials, Halliday worked furiously, sending the power into this rocket tube and then that, as the ship swung perilously close to the onrushing world.

There was no time now for observing the lunar craters. All of the crew's energy was turned into the battle to stave off a precipitous collision with the pitted lunar surface. Closer and closer came the two flying bodies, more and more the ship swung erratically this way and that as the moon swung by beneath them.

Parker, dizzied by the rush of the moon's surface beneath them, had yielded his place at the telescope to Benedict, who coolly called off their lunar positions. Helpless, with fear whitened faces, the others clung to their hammocks, watching this gamble with life or death.

Now they were barely a mile above the surface, a huge mountain towered into the heavens miles before them, Benedict shouted the warning. Halliday, sweating, gripped the lever that sent the ship careening out of harm's way.

At last Halliday shouted, "Hold on everyone, here we come!" A plateau loomed before them. The ship dropped swiftly, its path inclined to the onrushing flat surface. At once there was a violently crashing jar, the room turned upside down; there were screams of terror and then silence.

THE plateau on which they had landed, they discovered, when they had sufficiently recovered to gaze from the portholes, was really the northwestern rim of Archimedes. Far in the distance, they saw on every side, great walls leaping upward to the depthless black skies.

Bruised, weary, exhausted they gathered about the portholes. They exclaimed in wonder at this world of monstrous mountain masses that had seemingly been torn from the land and thrown upward with the careless hand of a giant.

Clayton was for putting on space suits and exploring the lunar surface at once, but Halliday restrained him.

"The moon is no picnic ground," he warned pointing to the irregular patches of shadows thrown by cliffs upraised against the sun. "If you don't watch out you either freeze or roast out there. The sunny side of the moon is at a boiling temperature and the dark side close to absolute zero. So wait until we can get the lay of our land."

While Morse served the last meal in the disordered control room to the hungry adventurers, Halliday focused his attention upon the details of the lunar surface. He saw quickly that the lunar day was about forty-eight earth hours old upon the part of the moon where they rested. There was no immediate danger, therefore, of being suddenly caught in the horrible cold of the two-week night.

Consulting his map, he traced in his eye the details of the scenery about them. The place upon which they had landed was nearly fifty miles southwest from the part of Archimedes where the menace was believed to exist. Thus far they were safe here, by the protecting walls about them, from the prying eyes of any creatures who might inhabit the other part of the crater. Here they could become accustomed to the conditions on the moon, and prepare gradually for the final test of the moon menace.

For the next twenty-four hours, encased in space suits, the little band cruised over the lunar surface in their neighborhood testing their newly won power over gravity. They learned to jump high into the air and land safely; to float majestically over the space ship. They learned to walk when need be, close to the surface, and take advantage of all shade offered by outjutting rocks.

It was evident that none of them could remain exposed to the sunlight for more than a few minutes at a time; and Morse who had defied Halliday's warning was already ill from a minor sunstroke. The space suits had been built carefully with this contingency in mind, but nothing could withstand for long the merciless floods of solar heat that poured down upon the unprotected lunar surface.

They had been on the moon for some twenty hours when Halliday called them together. He could see in their faces a worn look indicating clearly that they all suffered from the unaccustomed brutality of nature on this dead world. But their faces were resolute too, as they waited patiently for him to speak.

"The earth is depending on us now, folks," he said soberly. "Our picnic is over, the dirty work starts. Over there to the southeast is our goal. If we find it dead and empty like this," he waved his hands expressively about him, "no one will be more glad than I. But if we don't, then there's going to be hell to pay."

He turned to the white-faced Morse who lay in his hammock listening. "Are you well enough to join us Morse?"

The little man sprang from his bunk. "You can't leave me behind," he threw out his fist aggressively.

Halliday gave a little laugh. "Then our parties are as before. Benedict, you take the easterly path to the crater. Your job is to get there as soon as possible, keeping yourself under cover at all times. Get as close as you can to the crater, and when you have seen what's there, or what isn't there, come back here. We will do the same. But in any case we must meet here again in 18 hours."

Perkins whistled. "Sixty miles there and back through this heat in eighteen hours. Have a heart, boss."

Halliday smiled. "Remember we're on the moon, Perk. You go six times as fast."

He turned to a box set into one wall, and drew out a dozen revolvers and rifles.

"For defensive action only," he warned. "Have you enough water and food for eighteen hours?" Each man nodded. "Enough oxygen?" Again came the affirmative. "Then let's start."

In the bustle of preparation to encase themselves in the space suits, Halliday turned to Clayton and Landay, who looked on grimly.

"I haven't any idea that you boys have a cinch here," he gripped their hands. "I know you'll do your jobs, and you'll hold the ship for us, no matter what happens. If we lose the ship we may be stranded here for life."

They nodded understandingly, and moved to the airlocks, to usher into the great adventure the rest of their comrades. One by one, as the six stepped into the airlock, the two who were to remain waved affectionate goodbyes.

Once upon the surface, the two parties faced each other. Encased in their suits, gripping clumsily their weapons, they could only salute each other, before setting off upon their separate paths.

Clayton and Landay watching eagerly through their ports, restraining inexplicable tears, saw the parties move quickly away. Like two sets of metal monsters, the parties separated more and more, with the sun glinting fiercely from their polished sides. They bobbed up and down as they ascended little hills and disappeared into craters. Swiftly their sizes dwindled as they moved away until finally all that could be seen of them were two spots of light, shining, then lost to view, shining again, and finally disappearing.

TO BENEDICT and his two companions moving over the eastern route to the crater of unknown terrors, the silence of the moon was terribly oppressive.

Setting their first goal for a huge peak that loomed slightly to the south, they moved swiftly across the broken table-land. They pursued an erratic and circuitous course as they dodged from hole to hole, taking advantage of all possible shade.

Their sense of isolation on this world of sharply jagged peaks, sun-baked plains where not a single thing grew, and the ominousness of the black sky overhead, kept them silent for a long time. Only the crescent of the earth, hanging low in the west, gave them the courage to plod on mile after mile through the smothering heat.

Several times, as if by agreement, they stopped to gaze longingly at the hanging ball that was their home; and to trace out the continents that meant safety and security. But the realization that the place of life and love might be turned into a house of terrors were the moon menace to exist, drove them on, even when they would have stopped.

They had gone on about five hours, and long since had lost sight of the ship and Halliday's party, when Perkins stopped suddenly at the crest of a little ridge and emitted a shrill warning into the disc phone.

"My God!" he shouted, "look!"

He had scrambled back into the security of the little hole from which they were emerging and pointed out toward another eminence directly to the west.

Hugging the hot ground the others peered out from their shelter. They saw moving across their vision a band of creatures that verified their worst fears. There were more than a dozen of them, two-footed, two-armed things, towering nearly seven feet tall, that stalked, sharply etched by the sun across the lunar skyline.

They were about a half mile away, yet even at that distance, in the airless void, the three earthmen could see that they were some form of man, encased in fur-like suits. The suits were cylindrical, bulging enormously at the chest, and elongated above the head, like a stovepipe, giving them a curiously absurd appearance. But the long purposeful stride of the group, as they deviated neither to the left nor right in the pursuit of some unseen goal, gave them a dogged and sinister air.

The men had been stunned to silence by this vision. At once they plugged into their phones.

"What are they?" Morse cried.

"Our friends, the Martians," Benedict answered from his phone. Although he tried to keep his voice unconcerned, it quivered with intensity. The man who welcomed unknown dangers scented a new and exciting hunt.

"What'll we do?" Morse asked. He gripped his rifle.

"I say, let's get closer," Perkins whispered, as though he might be overheard. "We can cut across," he pointed to a gully that shot off to the west, "and then see where they're goin'. Maybe they're movin' toward the ship."

"Good idea," Benedict commended. "Let's go."

Cautiously the three moved along the bottom of the thirty-foot gully, climbing cautiously to its top every hundred feet to observe the Martian group. For they already accepted the strangers as Martians and realized that here were the vandals of the earth that John Wingate had pictured.

They had advanced about a half mile, when Perkins suddenly plugged in with an exclamation.

"My God!" he exclaimed, "They're going to meet Halliday's party."

Benedict swore. "They will, at that."

"We've got to do something," Perkins whispered. "Let's go at them."

Benedict looked through his visor in admiration at the little man.

"Right you are, Perk. Are you with us, Morse."

"Ye—es," Morse stammered. "Count me in."

Benedict peered again from the crest where they were observing the Martian group. He saw that in another ten minutes they certainly would pass close to where Halliday and his party would be innocently moving westward. The Martians lay, in fact, almost between the two earth parties. Their sole chance was to hurry along the gully, which seemed to be endless, and to cut in between Halliday's party and the Martians.

Quickly explaining this to his comrades, Benedict moved forward, forgetting now the sun's blistering heat, and their growing weariness. Perkins, who seemed intent only on saving Halliday from an ambush, was in the lead when he suddenly stopped and spoke huskily into the phone.

"I think they've sighted Halliday."

The others gazed ahead and saw that the Martian group had halted. They were clustered together peering toward the south, conversing among themselves. Although they had evidently sighted something they betrayed no excitement. There was something curiously cold and passionless in their attitudes.

Perkins had already raised his rifle. "Let's let them have it," he shouted into his phone. Sprawling to the ground, he took careful aim and squeezed the trigger twice. A shot seemed to take effect for one of the Martians whirled suddenly, threw up his great arms and sank to the ground.

Benedict and Morse had also taken cover and had dropped two more of the Martians before the latter seemed to realize that they had death-dealing enemies to confront. Then slowly they took what shelter their exposed position afforded, while a hail of shots poured into their ranks. Another Martian rolled over, as the others seemed to whip from bag-like coverings long pistol-like contrivances of dull metal. Whipping them about across the lunar surface they caused the stone to heat instantly into lava where the unseen beams had touched.

"What's that they've got?" whispered Morse, as the barrage of heat beams came closer and closer.

"God knows," Benedict answered desperately. "They seem to be able to melt the whole moon."

By some queer sense of direction, the Martians were gradually focusing their rays toward the earthlings' shelter. It seemed but a few minutes before the whole hillside where the three men lay would be heated instantly into an unbearable molten fluid that would force them into the open.

One beam just grazed the top of the hill. There was a sputtering flame across the men's vision and with a shrill cry of pain Benedict rolled to the bottom of the gully. One arm of his space suit had been fused together two inches above the wrist!

With exclamations of horror his companions scrambled down after him, and saw that the metal of his arm had melted into a mass effectively sealing the stump of the wounded man's arm. He lay motionless.

"You look after him," Perkins shouted. He scrambled back to the top of the hill and peered cautiously towards the Martian group. There was a movement at his side, and he found Morse beside him. The cook was blubbering into his phone.

"I think Mr. Benedict's dead," he sobbed.

Perkins shook him violently. "Keep up, fellow." He pointed off toward the Martians who had now risen, satisfied that their enemies had been extinguished. They were preparing to move westward again.

Perkins threw down his rifle and removed the steel shoes that provided a measure of stability on the moon.

His voice was uncertain in the disc phone as he picked up a pistol. "I'm going to warn Halliday," he said. "And if I don't get there, tell Halliday that he was a good guy. You look after Benedict and get him back to the ship."

Morse was about to remonstrate, when Perkins suddenly emerged from his hiding and putting all his strength into a leap went flying southward toward where he believed Halliday to be.

Morse watched with horror and admiration as the ex-convict fearlessly leaped across the lunar landscape. The Martians had already seen him; and after recovering from what must have been their unutterable astonishment, they had turned their beams on his flying figure.

He had gone a quarter, then a half mile as the futile heat beams played about his flying figure. And always when they struck the surface, he seemed to have already moved on.

Slowly the Martians were narrowing their range. Closer and closer came the deadly spurts of molten rock as Perkins moved upward toward a high slope a quarter-mile away.

Once he went down as a beam came within inches of him. But he was up again, legs and arms flying madly. But inexorably, the beams circled him, walling him in. With deadly precision the Martians were seeking to stop the man's flight—rather than kill him. But he did not stop. With a last leap he gained the peak of the slope, and fired his pistol at some unseen target beyond.

And at that moment the circle of beams closed in. Morse groaning in despair saw him suddenly throw up his hands and collapse.

CHAPTER IV

Panic On Earth

WHEN John Wingate had watched the *Flame* roar into the night and ascend like a meteor into the heavens, he had turned away with an intense loneliness. Only his age, and the necessity that he remain at his telescope while the ship plunged to the moon, had prevented his accompanying the expedition.

But as he returned to the observatory his thoughts turned in anger to the "cowardly fools" in Washington. It was their refusal to heed his warnings that had probably sent these brave men to their death.

Only the threat that he would lose his post should he publish his conclusions on the Martian menace, had sealed his lips. What this rugged old man would have liked would have been to denounce the government in every newspaper. But what then? He would be ousted from his post, some dull fool would succeed him, and the world would live in blissful ignorance until the day of the Martian invasion began.

For John Wingate had no doubt that it would come. His logical mind did not question what creatures could exist on Mars and what their power might be. As an astronomer he had seen the evidence on the moon. He had seen the remains of a giant shell that had been fired from the moon. True, it had been partly fused in its passage through the atmosphere. But even such a great mass of metal striking a populous town would do incalculable damage.

No, he had best remain silent now, and wait until Halliday could discover what lay in the mysterious crater. Then would come the time to act. Halliday had left in his care a complete set of prints for his space ship. Benedict had turned over what remained of his huge fortune. If need be, Wingate resolved, he himself would build another ship and gather a crew to follow Halliday on his perilous adventure.

But a blow awaited the old man on his return. Upon his study desk lay a neatly folded note. It was addressed to "Dear Daddy."

"Forgive me, daddy," it read. "I could not let David Halliday go on this alone. I belong beside him. He will take care of me. Nina."

Wingate groaned softly. He dropped into his chair. His indignation was gone now. The only person who was close to his life and work, his daughter Nina, had left him. And he, really, was the cause for it. For once, for a moment, Wingate wished deeply that he had never spoken of the Martian menace. He wished even that his precious telescope might be destroyed if only his girl were returned.

But then as he wandered into the spacious room where the giant tube focused its searching eye upon the living half moon, the old man's will stiffened. His place now was at this eyepiece. Now he could not leave it. Any hour and moment some signal from space might determine the life and death of the expedition. Focusing the great lens, he grimly set the automatic control to keep the eye continually upon the moon, and began his search of the void for the *Flame*.

Twenty-four hours passed before Wingate caught his first sight of the ship. Close to the lunar rim, he saw it flash with the sun's light, and then disappear behind into the moon's hidden half. Fruitlessly, hour after hour, he watched intently for its reappearance. He realized that only chance had afforded him the view of such a small object as the terrestrial ship, and unless the right combination of circumstances occurred, he should not see it again.

Wingate had employed another assistant, Freud, a young German, who had been gradually initiated into the secret. When Wingate's eyes could no longer stand the strain of scrutiny of the waxing moon, Freud would mount the high stool beneath the eyepiece and take his master's place.

Two weeks went by. Not a sight of the *Flame* had been found since it disappeared into the moon's shadow. And to the newspaper reporters who thronged the Kingsley Observatory day after day, Wingate could give only the sad news, "Nothing new."

Day by day the number of reporters who appeared before him dwindled. And gradually the story of the "DISAPPEARANCE OF THE *FLAME*" that had screamed in newspaper headlines, began to shorten, and it was finally consigned to obscure mention on inner pages of the great journals.

It was early in the evening, sixteen days after the *Flame* had rushed away from the earth, when Freud at the eyepiece excitedly called for his master. Wingate, resting in his room from the strain of a hard day, dashed half dressed to the telescope room.

"Mr. Wingate," breathed the German, "I see something approaching. It looks like a ship. Only not so big."

Pale-faced Wingate seated himself on the stool and gazed into the bright, waning face of the moon. Yes, there it was, just off to the left of the center. Hardly moving. But it stood out distinctly from its background. It seemed to be two-thirds of the way from the moon to the earth; and was perhaps thirty feet long. Could it be the returning *Flame?*

For hours, motionless, frozen at the eyepiece, Wingate watched the steady approach of the space ship. And when his eye, blurring, could no longer see it, Freud helped him down gently and took his master's place.

Four more hours passed before Wingate could again return to the telescope. And now, what the frightened, stammering German told him, set the astronomer's face in grim lines.

SETTING the focus for the approach of the ship, Wingate saw to his horror that the object was but ten thousand miles from the earth. And instead of being a ship, it was a torpedo-like shell, nearly a hundred feet long, of a dull blue luster, plunging mercilessly upon the earth!

But slowly the messenger of death was escaping from the range of Wingate's telescope, until at last with the slow rotation of the earth he had lost it altogether.

Swiftly he descended from the stool.

"Quick," he hissed to his assistant. "Send this telegram to the Tokyo, Peiping, and Madras, India Observatories. 'Watch for projectile-like object approaching earth from eastern edge moon's rim. Two hours from earth—Wingate, Kingsley Observatory.' "

As Freud rushed to one telephone, Wingate was already speaking into the other, connected directly with the hotel in which the remainder of the newspaper group now lived.

"I have an important story for the reporters," he said briefly and hung up.

And while the telegraph wires to the far east sang with the message of approaching horror, Wingate, surrounded by a half dozen incredulous men of the press, gave his story.

"In one hour and thirty minutes," he said abruptly, "a shell from a gun on the moon will strike the earth. It will probably land in the Pacific Ocean close to Hawaii. This is but the beginning of a systematic bombardment of the earth—an attempt to wipe out the race."

"And who is doing all this?" asked one reporter grinning.

"Creatures from the planet Mars," Wingate answered flushing.

A chorus of nervous laughs came from the press men.

"How long have you known this, professor?" asked one with increasing levity.

"For two years," Wingate snapped. "And your government has known it for that long too." His nervous tension snapped. "Good evening, gentlemen, I see you belong to the class of fools."

But if the reporters were incredulous, the editors were cautious. Wiring the observatories in the east, they ascertained that the shell was swiftly nearing the earth. By unanimous agreement, all stories were withheld until the fall of the mysterious shell was completed.

To those who observed it, it came like a dazzling white sword of vengeance across the eastern skies. With a thunderous roar heard for hundreds of miles, it crashed through the atmosphere flaming to incandescence and lighting up the sea for miles. Then it plunged recklessly into the sea.

On a little island frightened natives dropped to their knees gibbering vain pleas to their gods, as wave after wave of heated air swept over them like thunder.

Widely varying accounts of what Wingate had prophesied and what had been seen over the Pacific, appeared in every newspaper. Breathless multitudes filled the streets in every city, watching with apprehension the half moon floating calmly overhead.

Only four hours had passed since the fall of the shell when word was flashed around the world that another was on its way, and this would doubtlessly fall close to the Chinese coast. Arching through the sky it landed in the bay off Hongkong, crushing to nothingness and setting afire hundreds of vessels anchored in the bay.

And with the precision of a clock came a third shell crashing through the skies to land upon the Siberian steppes.

Then abruptly the shells ceased, and a world on the verge of panic breathed easier.

But as the world recovered from its first shock, and the press of the earth filled its sheets with the full descriptions of the Martian menace, there centered about Wingate a controversy that a single man had never endured. Denunciation and counter denunciation, denial and blame, criticism and praise for each of the characters involved in the drama, filled the press—to keep the world aroused to an intense pitch of excitement. As two days passed and no more shells fell, the horror of the earth turned into a savage search for a scapegoat in this episode.

Wingate was both lauded as a racial hero and denounced as a public menace. Throngs crowded the little mountain town upon which his laboratory stood, to render him homage. But when he appeared on the steps to acknowledge this tribute, a shot rang out from the crowd, barely missing the astronomer's head.

The attempted assassination served but to increase the violence of public opinion, and a half dozen nations tottered on the brink of revolution.

But it needed the incident of the third day, the calamitous 18th of April, 1947, to bring upon a blood-mad world the icy hand of sanity.

Early in the evening a shell was seen approaching the earth, to land with extreme violence two hours later in the midst of the beautiful Chilean city of Valparaiso. Hundreds were killed in the ensuing explosion, and a fire that swept rapidly through the city killed hundreds more.

Barely had the news appeared upon the streets, when a strict censorship of newspapers was declared in a dozen nations. This served but to throw into great terror the hundreds of thousands that crowded the streets in every civilized city. But they saw, those who were fortunate, a succession of shells shooting four hours apart upon a defenseless earth. For twenty hours, the bombardment continued, ringing the earth from Chile to the shores of Australia. Five fine dents puncturing the skin of the earth.

But the people of the earth had spoken. They stormed every public building, crying aloud John Wingate's name, demanding in the name of suffering humanity some action to ward off this hail of metal that threatened to destroy them all.

And one day in a room in the White House in Washington appeared fifteen grave, frightened men. Among them all one man stood straight and unafraid. Of these delegates of the great powers, John Wingate asked an immediate appropriation for the building of three dozen Halliday space cruisers, equipped with armament to fight the mightiest foe the earth had encountered.

And the delegates, listening to the thunder of a mighty crowd pressing against the White House doors shouting the name of John Wingate, agreed unhesitatingly to his terms. Fifteen nations were to build this mighty fleet, and under the command of Ferdinand Cross, premier air fighter of Great Britain, they were to ascend to the moon in defense of their race. A second fleet was to be constructed as fast as the first was completed, and a third fleet and as many as the factories of the earth could turn out until the Martian menace had been swept from the heavens.

Through weary weeks the construction progressed. And to the ringing of giant hammers, the boring of guns, the fitting of plate to plate, there came at intervals of three days, a twenty-hour bombardment from the moon. Detroit lay a mass of ruins. New York had been grazed, Bordeaux counted a thousand dead and Manila was set aflame before the first fleet was finished and Cross was ready to take to the air.

And with John Wingate, reconciled to the death of the brave crew of the *Flame,* there stood on a great mountain top a hundred thousand people, as they waved "God speed." The fleet rose with the roar of a thousand cannons flashing into the skies to disappear swiftly into the night.

CHAPTER V

Captives

HALLIDAY turned away from the wall, and wearily returned his watch to his pocket. He looked down to where Nina and Parker slumped on the floor.

"What do you make it, David?" Nina asked softly.

"Just two months," Halliday shrugged. "I don't know whether we're lucky or not to have my watch to keep track of our imprisonment."

He looked with despair at the rough mud-like walls of the little one-room hut of their confinement. Today was the sixtieth day since the group of furred monstrosities had rushed down upon them walling them in by a ring of heat beams. Caught by that barrage of death, they could do nothing but submit to capture. They were hustled for miles across the scorching lunar desert, to where a strange barrel-shaped vehicle carried them through the void into this great encampment of their enemies.

Of that day, two months ago, the three captives had but a single stark memory—of a figure in a space suit firing his pistol toward them to attract their attention. It must have been that, for he had gone down a moment before the Martians came, fused into his shapeless metal suit. Who he was, none of them knew. Of the other members of the *Flame,* they knew nothing. Doubtless they were dead, the ship in ruins.

In their crude attempts to question their Martian captors by sign and pictures, they had obtained no answer as to the fate of their companions. The Martians, large, barrel-chested, large-headed, monstrosities in human form, stared with their green-skinned, emotionless features making no reply.

Once a day the captives were taken before what appeared to be one of the Martian learned men, and a process of education in the Martian tongue was going on. English as a language had been given up by their teacher as hopeless.

Except for their brief exit from their flat hut, accompanied by a guard, to the hut of their teacher, they were confined rigidly to their quarters.

But Nina, sharp-eyed, had learned much of the nature of the great encampment, near whose center they were. It was she who had seen, two miles away, beyond an eternity of other mud-walled, flat-roofed houses, the titanic mass of the great gun.

In their prison, after their next lesson, she had breathlessly told Halliday about it, while Parker listened sullenly.

"I'm sure it's the gun they're going to use against the earth," she ended. "Oh, we must do something about it!"

That had been before the bombardment began. Then, one day, as they measured days in their prison, there had come a terrific tremor along the earth, so great that even the stout walls had trembled. Four hours later had come another, as the three groaned in their impotence. They gradually learned the rhythm of the shots and waited in terror for each succeeding missile of death, picturing in anguish, the growing devastation of the earth.

For they had learned already, by sign and picture from the big-headed stolid Martian teacher, that it was the intention of his army to terrorize the earth to the point of subjection before the conquest of the earth began. They knew, the Martian explained without feeling, that no race could withstand a ceaseless bombardment. Their scientists who had examined the three captives knew the exact breaking point of the human race. When the bombardment had brought the earth's people to the proper state of terror, five hundred ships would rise from the moon to sweep down upon the earth. And of the earth's people who survived the invasion, only those who could serve the captors would be saved.

To Halliday's question of why this must be so, the green-skinned Martian teacher had replied simply. Mars was a desert, its people dying. Their telescopes had shown that the earth was inhabitable, the first expedition to the moon four years ago had verified it. Their telescopes had shown also that the earth had ships, cities, and other marks of a respectable civilization.

Millenniums of struggle for preservation on a dying world had stamped from the Martians all desires except that of survival. To survive they needed the earth, and they would take it.

"Then why do you keep us?" Nina had asked one day in torment.

"Because," answered the old Martian, "we need you to teach us the earth ways, to acquaint us in detail with its peculiarities and to help us avoid senseless mistakes when we conquer it."

This in the halting language of Mars that the captives knew, reinforced by signs and gestures, was the reason given to the three earthlings why they were still alive.

Many times as the three passed endless hours in their bare room, waiting for the next great shell to go plunging toward the earth, Parker vowed he would end his life.

"What's the use of going on?" he cried. "We are lost now, slaves of these green-skinned beasts. We might as well be dead."

Halliday and Nina glancing at each other saw that the man was fast losing his senses.

Halliday had come to love Nina, in the intimacy of this confinement, and it was difficult for the two to hide their love. As they exchanged soft words, Parker would look on bitterly or get up to pace feverishly about. It was the loss of Nina, and the necessity of facing continually the growing love of his companions that was drawing from Parker the last reserves of his sanity.

IF IT were not that Halliday and Nina believed that they had found each other so magically, they would have agreed with Parker and ended their lives. For they saw with despair the invincibility of the Martian encampment. For miles it extended about them, tens of thousands of the green-skinned men, encamped in these air-tight, mud-walled houses, that Martian genius had constructed from the lunar rocks. Ceaselessly, detachments of the emotionless men moved with precision and efficiency across the great encampment, moving machinery here and there, engaged in maneuvers, arranging supplies.

Earth and Mars had already separated in their orbital paths and two years must elapse before physical communication with their home planets could be resumed. This expedition then must decide finally whether the Martian plan of centuries—the conquest of the earth—would succeed or fail. And about the Martian activities, the captives could sense now a growing organization, the preparing for a master stroke that was not far off.

It was the Martian gun, rather than the hundreds of blunt-nosed space ships, or the Martian personalities, or their efficient organization, that fascinated the earthlings the most.

Since Nina had pointed it out to them, they could see it each day, as they passed in their space suits along the narrow street to the place of their daily lesson.

The great gun lay alone in a half mile open space in the center of the vast encampment. Hundreds of feet high, the monster of metal rose above the crater floor, making the Martians who operated its machinery appear like midgets. The cyclopean snout of the monster was five hundred feet long and twice as the captives were on the way to their tutor, there charged into the sky soundless, flashing meteors of destruction, earthbound.

So it was in desperation that Halliday had counted off upon the mud wall the sixty marks that registered the earth days of their incarceration.

Upon a stone bench lay the pot of gritty gruel, that served them as food. This stuff that had retched their stomachs numberless times before they could accept it, had been their sole diet for two months. Twenty paces away was the door that led to the main aisleway of their hut, and to the outside.

Plan after plan had been discussed by the prisoners for their escape but the futility of them had cut short all discussion.

They needed their space suits, which the guard brought with him each day, in order to venture outside the hut onto the airless moon. But even if they could escape from their guard while in their space suits, they would still be near the center of the Martian encampment, surrounded by ten thousand men ready to turn upon them their deadly heat rays. And as day after day had passed, they saw in the Martian activities the growing readiness for the earth invasion.

Halliday slumped down beside his companions. He groaned softly. "It's the food, the awful food, that makes it unbearable," he sighed comically. "Think, the rest of our life on this gruel."

Nina laughed. "If that's all you're worrying about."

"It's hopeless," Parker echoed hollowly.

"If there only was a way," Halliday cried, now desperately serious. "No matter how remote, I would chance it."

He looked up to the flat roof of the hut, twelve feet above their heads. Then he suddenly sprang to his feet. A sudden light of inspiration blazed in his eyes.

"Nina, Parker!" he exclaimed. "How far is it from one building to another?"

"Thirty feet," Parker answered dully. "What good does that do us?"

"Thirty feet," Halliday pondered a moment, and then made vague gestures of measurement with his hands. He looked up at the ceiling speculatively, walking back and forth excitedly. He suddenly clapped his hands together.

"It's worth it, it's worth it!" he exclaimed, as the others looked on in amazement.

Nina ran to him, "Tell us, David, what is it?"

Halliday came to a stop. His jaw fixed determinedly. "We can escape!" he said shortly.

Parker gazed at him anxiously. "How?"

"By outthinking the Martians," Halliday replied. He squatted on the floor. "Look," he said.

And as the others gathered about him, he drew diagram after diagram of the Martian camp, their position in it, and of the rugged cliffs that loomed to the north, beyond which lay the wreck of the *Flame* and their hopes.

Nina's eyes danced as Halliday explained his plan. "It *will* work, David, it must." She hugged him enthusiastically. Then remembering Parker, she went to him, "Are you with us, Floyd?" she said tenderly. "We can escape, come back to the *Flame*."

Parker's eyes flamed. "Anything, anything to get out of here."

For the next two days, the captives gazed eagerly about them as their guard led them through the streets for their daily lesson. Secure in the captivity of the earthlings, the Martians were taking what they believed to be sufficient precautions against escape.

The endless extent of buildings between their own hut and the mountain range to the north interested the earthlings the most. A full mile separated them from the apparent security of the mountain. If they could only somehow accomplish that mile!

Two days passed before they were ready.

It came at the hour when the guard brought their three space suits. As he entered as usual, closing the stone door behind him, before him on the floor lay the "earth girl" and pointing to her with evident horror were the two earth men.

"Dead," they said terror struck, in the Martian tongue. "Dead."

Dropping the suits, the Martian approached curiously, and carefully bent over to examine the girl. Then the earth men struck. Down on the Martian's head came the heavy stone plate. And as he crashed soundlessly to the floor, Parker had snatched from his belt the heat gun, his sole weapon.

ACTING quickly, for in two minutes they would be expected by the guards outside to appear in the doorway, the earthlings worked into their suits, snapping on the oxygen containers. At a nod from Parker and Nina that they were ready, Halliday flashed the heat tube upward against the roof of the hut. Crackling and splintering, the lava fused away from the playing beam. And as the air rushed whirling out, a gaping hole appeared in the roof, exposing the black starry skies. Around and around Halliday played the beam until an eight-foot hole yawned twelve feet above them. Then he looked at the others. They were ready for the great gamble.

All was silent in the room. With a gesture of assurance, gauging carefully his position beneath the jagged roof, Halliday leaped gently upward, soaring just beyond the hole, landing easily at the roof's edge. Dropping flat upon the roof he motioned to Nina. She leaped upward and was soon beside him. Parker, more clumsy, and too eager, caught at the roof's edge as he sailed past it, and only Halliday's outstretched hands saved him from falling back.

Lying prone upon the flat roof, they took stock of their position. A mile away lay safety. Once beyond the Martian camp they could rapidly ascend the mountain walls, and taking refuge in its innumerable crevices and caves, escape detection for a time. Only the blasting of the entire mountain could bring them out.

Around them they saw only the vast grey checkerboard of roofs. Between were the streets filled with Martians. The three could remain unseen so long as they remained in the center of the roofs. But when they had to leap across thirty-foot streets, would come the certainty of detection. And then it would be a race between their agility and the deadly accuracy of the Martian beams.

At a signal from Halliday they rose, and as his arm went down suddenly they leaped forward and with an easy jump crossed the first street, landing upon the next row in safety. Not hesitating, they leaped on and on, from roof to roof, under the hot starlit sky. Like winged creatures, they soared over street after street above the heads of stolid Martians too surprised to catch sight of the shadowed apparitions above them.

Nearer and nearer loomed the mountains, higher the cliff swept above the panting trio, as they plunged on breathlessly toward safety.

A half mile from their goal and Halliday saw that their escape had been perceived. From a street intersection, as he flew across he saw a detachment of Martians deploying to cut them off at the next street. Allowing his companions to go on, he hesitated in his wild flight, and brought into play the frightful beam of the heat ray. As the intense ray flashed death among the startled group, he rushed on, slowly catching up with Nina and Parker.

But a quarter of a mile to go. They were now in the shadows of the mountain. They were becoming winded; Parker faltered, then Nina stumbled and Halliday caught her up. A beam flashed close to them, then another, and Halliday saw that from two sides his pursuers were closing in.

Another street was crossed and then another, and to their unutterable relief they saw beyond them a long low flat roof, the last before safety. But as they rushed breathless across it, there appeared on the ground just beyond three furred figures leveling heat rays.

"Down," screamed Halliday uselessly, pulling down Nina who was at his side. But Parker who had gone on unheeding suddenly slumped to the roof. Blazing with anger, Halliday rose and, leaping recklessly forward, played his beam, dealing death upon the furred group.

Then lifting the motionless Parker, he urged Nina on.

Gently they leaped from the east roof, Halliday bearing the burden of the unconscious man. Stepping over the charred heap of Martians, they began their slow but laborious climb of the mountain. And not too soon, for behind them streaked a sizzling path of the heat rays as the pursuers vainly attempted to lengthen their range.

To the captives, the race for freedom through the endless chasms, caves and gullys of the mountain range was an unending nightmare. Without water or food, burdened with the limp form of Parker, never resting for fear of instant death, Halliday and Nina went on and on, upward and upward, farther and farther from the place of their captivity.

Once they emerged to see far below them the grey checkerboard of their camp, and at the edge of the camp a swarm of furred figures begining the ascent.

Urged on by Halliday when she could go no further, Nina wandered as in a dream, legs and arms moving mechanically when the will would no longer control the body.

A narrow chasm cutting across the peaks proved their salvation. They came upon it unexpectedly from a cave in which they had taken a few minutes of urgently needed rest. Ten feet above the cave was a rocky shelf, and jumping up, Halliday perceived leading northward, a widening gully through the mountain.

It required all of his strength to jump upward with the unconscious Parker in his arms and land safely upon the gully floor. But once there and with Nina at his side, they moved more slowly, more certain of their escape.

But as they moved on, the telltale warning of the dwindling oxygen supply in their helmets aroused a new spectre of death. They were still miles from the landing place of the *Flame*. A burning desert lay between, and only a half hour of oxygen remained before suffocation.

Moving in a dream of approaching death, the three reached the northern walls of the mountain. Beyond stretched farther illimitable deserts. Nina sank to the rocks exhausted, and not even Halliday's violent shaking could arouse the figure in the space suit to further effort.

Desperate, as he sensed the last moments coming, Halliday tried to rouse Nina from her growing stupor of suffocation. A mist was coming before his own eyes, as he gazed down at the two silent metal figures.

Wild visions of the earth, of peace and security, flew before his disordered brain. With a laugh of despair he lifted the ray tube and pointing it toward the plain just beneath them, pulled the catch, sending the full power of the rays upon the parched earth, fusing the rock beneath. Until the power of the tube was exhausted, he held the catch back, laughing as he watched the rocks leap and crack and fuse under the furnace of heat he had created. This was his last gesture of defiance against this dead world of despair. He sank down close to the metal armor that enclosed Nina and vainly tried to circle it with his arms . . .

CHAPTER VI

Martian Guns.

TO MEN accustomed to a world of silence, the usual noises of life strike them with a sudden deafening blow. This was true of David Holliday as he emerged from a drugged stupor. Instinctively he put his hands to his aching ears, even before he opened his eyes. Then at a touch on his sleeve, he suddenly recoiled and looked upward.

A trim looking young man in a strange brown uniform looked down on him sympathetically, "All right now, sir?"

Halliday struggled to sit up, but the firm hand held him to the soft bed on which he lay. For a moment he listened to the sounds of voices—voices of human beings—English, French, German—voices of young men, eager and unafraid. This after the two months among those dried, mummied Martians.

"Where am I?" he asked weakly.

"On the Halliday rocket ship *Condor,*" the young man said smiling. Then he turned at another's approach. "Mr. Halliday's conscious now," he said to the newcomer.

The man who now looked down upon Halliday, seemed to his blurred senses to be vaguely familiar.

"You are . . . "

"Ferdinand Cross, in command of the Lunar expedition," he said genially.

Halliday stiffened. "We are still on the moon?"

Cross nodded, his eyes twinkling.

Halliday's hopes rose. "And the Martians?"

Cross frowned. "We haven't met them yet."

Memories surged back into Halliday's mind. "Miss Wingate and Parker," he exclaimed, "where are they?"

"Resting comfortably, in other rooms."

"Then you picked us up?" Halliday breathed gratefully.

Cross nodded, and then at Halliday's insistence, he told the story of the bombardment of the earth, the building of the first fleet and their landing on the moon. Their finding Halliday, in the crags of the mountain range that surrounded the crater, was the merest accident. A ship sent out to reconnoiter the Martian position had seen the seething ground, fused as Halliday in his last gesture had turned the heat rays upon it.

They had descended, picked up him and his companions in time to avoid an encounter with a Martian detachment, and had brought him back to the encampment of the earth group.

Halliday listening in wonder to the tale of his miraculous escape, noticed with sorrow that no mention of the *Flame* had been made. Then it was lost, its brave crew dead. . . . He questioned Cross hesitantly.

"This man could tell you best," Cross motioned to someone behind him, and stepping aside he revealed to Halliday the thin, emaciated face of—Morse!

He stretched out eager hands to the little ship's cook. "Morse! I'm glad to see you."

The little man's eyes were wet. "And me you, Mr. Halliday. We had given you up for lost."

"What of the others?" Halliday asked brusquely. His fears were becoming stronger.

Morse hung his head. "They're all dead, sir." And as Halliday listened he told the other half of the story of the fate of the *Flame*. He told how Benedict had been seriously wounded in the first encounter, and how Perkins had given his life to warn Halliday of the Martian approach.

"Then it was Perkins," Halliday breathed. "God bless the man."

Then, Morse went on, somehow he had managed to help Benedict back to the *Flame*. Through endless hours, with burning bodies and parched throats, the two men stumbled somehow through the inferno of the lunar furnace. And when they had reached the ship, completely exhausted, they had found—a shambles.

The ship had been almost entirely wrecked; dead Martians were everywhere, and among them, faces set grimly in death, were the bodies of Clayton and Landay. The meaning of the scene had been only too evident. The men had defended the ship until they had been simply crushed by a vastly superior force.

There was silence in the cabin as Morse, in his halting way told this story of the heroism of two unknown men.

"But Benedict," Halliday asked desperately after a time, "surely he . . . "

Morse tried to turn away. "He died after two days, sir. We had managed to fix up two of the rooms of the ship that hadn't been damaged. And with what little water and air and food we had, we kept alive. But Mr. Benedict was feverish most of the time, and suffered awfully. It was a good thing for him, when his suffering was all over."

Halliday roused himself from his stupor. If he ever returned to the earth, he would devote his life to seeing that these brave men were remembered, by every nation, by every man, woman and child. But now there was work to be done. The Martian bombardment . . .

And as if to emphasize his thoughts, there came a tremor through the ship, a strong steady vibration that on earth might presage an earthquake.

Cross nodded at Halliday's unspoken questions. "They've been at it continually." The man's face tightened. "We've simply got to put them out of business."

At the orders of the young doctor, Halliday was left alone, to muse over his own bitter memories. And every four hours came the signaling tremor that the armies of Mars were still confident and triumphant. The day of their attack on the earth could not be far away.

It took but another day for Halliday and his two companions to recover from the effects of their terrible experience. Nina rushed to embrace Halliday, clinging to him, sobbing quietly in his arms. Parker, his face sober and wistful, limped toward Halliday to shake his hand.

"I know you saved my life," he said falteringly. "I won't forget it." He turned away from the two lovers and limped into another room.

"Then Parker wasn't injured badly," Halliday questioned the doctor, who hovered about.

"A bad burn on his leg," the medico answered. "Part of the muscle tissue eaten away. He'll limp for the rest of his life."

"Poor Floyd," Nina said softly. "He is eating his heart out. His ego won't stand this crippling of his body."

LATER that day, Halliday, Nina and Parker were invited to a war conference of the earth expedition's officers. It warmed Halliday's heart to see the strong, young, eager faces of these men of earth, ready to do battle for the preservation of their race.

"We've held off any offensive action until you could join with us," Cross opened the meeting, addressing Halliday. "From your experience in the Martian camp you can probably advise us how to proceed."

Halliday pondered a moment.

"You must strike quickly," he said thoughtfully, "but you must strike surely. That big gun must be destroyed. Anything else you do will be hopeless."

"I favor a direct frontal attack," one young officer exclaimed.

"I, too," said another. There were affirmative nods around the council table.

Halliday shook his head wearily, as he looked around at these impetuous youngsters upon whom the earth reposed all of its hopes.

"That's suicide," he said. "The Martians have long-range heat guns that will destroy every ship that gets over the camp. What have you got to fight them with?"

"Three-inch quickfiring guns," Cross answered soberly. "Bombs, machine guns."

"And three dozen ships," Halliday smiled. "No," he shook his head decisively. "Only strategy will work."

"What do you propose?" one officer answered impatiently.

Halliday shook his head. "Nothing as yet. I must think about it."

"Think, think!" the officer returned exasperated. "That's all we've been doing since we landed on this God-forsaken hole. And every day the earth is being torn up by these monsters. Who knows but while we're here thinking, our own homes may be destroyed."

There were affirmative nods around the table, as Haliday, Nina and Parker exchanged hopeless glances. It was clear that these youngsters wanted simply to fight heroically, conquer their enemy and return to the soft green earth. But they did not know what their enemies were like. It took two months of incarceration in one of their prisons for one to appreciate Martian thoroughness.

"It's suicide," Halliday returned stubbornly.

"I call for a vote," said the impatient young officer. "Do we fight or wait for strategy?"

Cross nodded. "All in favor of a frontal attack rise!"

Two-thirds of the officers jumped to their feet.

"The frontal attack wins." He addressed the officers formally.

"Prepare for an attack," he looked at his watch, "in four hours."

With sinking hearts, therefore, the three weary explorers watched hours later as eighteen ships rose from the ground to shoot their streams of fire soundlessly into the clear airless void, and speed swiftly toward the Martian encampment.

"The Martians are too clever for us," Halliday told his companions bitterly. "They know that we're here, but they've let us strictly alone. They know somehow that we have no weapons to match theirs. So they prefer to allow us to attack and to dash ourselves against the power of their awful heat guns."

And so it turned out. Surrounded by the group of reserve officers in the camp of the earth forces, Halliday and his two companions watched groaning as the earth ships, now little flashing midges miles away, swarmed impotently over the Martian camp.

Flashes of smoke and fire showed the gallant attack the enormously overwhelmed earth ships were making. They swarmed over the camp loosing stream after stream of high velocity penetrating shells, sending hut after hut crumbling into ruins. Circling the camp they directed their fire inward toward the great mass of the Martian gun.

Charge after charge of bombs was dropped as they swiftly flashed across the Martian camp, sending hundreds of Martians staggering, without suits, out from their huts into the airless void, to perish there. There was no doubt but that great damage was being done.

But then the Martians spoke. From every part of the camp there came flashing toward the encircling earth fleet, the inferno of the heat guns.

One earth ship caught in the full blast of a ray shone glistening for a moment and spun wildly to the ground below—a molten coffin for fifty men. Then another one barely escaped the ray only to speed into a sister ship. Both danced wildly from the impact for a moment before they too dropped heavily to the ground.

With desperate courage the earth ships increased their bombardment, but one by one, they were caught in the pitiless blast of the Martian guns.

A dozen ships had been lost, and the earthlings had made no impression upon the Martian gun emplacement; the retreat was sounded.

Battered, scarred, the remnants of a gallant battle, the earth rockets streamed back over the dividing mountains, back to where their despairing companions awaited them.

Another conference of war was called the next day. Eagerness and impatience were gone now, and about the eyes of these youngsters who had survived there was the hardened light of veterans who had seen sudden death and faced it.

At this conference all eyes were turned toward Halliday.

"You were right," Cross said respectfully. "We have accomplished nothing. The Martians are impregnable."

HALLIDAY spoke slowly in answer. "The Martians are a curious people," he smiled. "They are emotionless, but like all emotionless people they have their weaknesses. They have placed their whole reliance for this campaign upon their big gun. Destroy that and you will crush them. Their present belief that they are sure to win will then change to as strong a belief that they cannot win. And once they believe in their defeat, they will simply lay down their arms."

There was silence in the little room. The significance of these words sank in. Then Nina spoke up. "We must act quickly. The bombardment is becoming faster and faster now. It is almost ceaseless. Shells were thrown every four hours, now they are sent every two hours, and soon it will be every hour. Think of what must be happening."

"Well, what do you propose?" Cross asked exasperated. The sense of impending defeat was beginning to soften the earthlings' morale. Halliday sensed this.

He realized that with defeat fresh in their minds, if the earthlings remained inactive too long, with the ceaseless Martian bombardment of the earth continuing, the men would recklessly plunge themselves against the Martians in a second futile attack and be wiped out.

The situation was desperate.

"Give me two hours," he said to Cross, "and I will give you a plan."

Cross nodded curtly, and the men rose and filed out. Halliday was left alone with Nina and Parker.

The latter's face was flushed and feverish. "If I could do something," he muttered. "Anything."

Halliday put his arm about him. "Easy, old man. We'll find a way out."

They walked through the aisles of the ship with Nina to her room. Halliday grasped her hand as she looked eagerly into his eyes. "We'll leave you here, dear," he said softly. "Floyd and I will talk this over with Cross."

Nina's eyes flashed in a sudden suspicion for a moment, and then squeezing Halliday's hand, entered her room.

Immediately Halliday grasped Parker's arm and pulled him toward their own quarters.

Helping Parker into a chair, Halliday faced him.

"Parker," he said eagerly. "You love Nina, don't you?"

Parker half rose, angrily.

"What are you trying . . . ?"

Halliday put up his hand. "Wait until I finish. This war with the Martians is going on now to a finish. If anything happens to me, I want to know that you'll take care of Nina."

Parker bit his lip. "Of course," he mumbled. Then he looked up. "But what have you in mind?"

Halliday walked up and down. "A desperate gamble," he said half to himself. "The Martians in order to shoot their shells every two hours must have a great number of them massed in their underground tunnels close to the gun. If we could reach those shells and start them off . . ." his voice trailed off. Then he came to a sudden decision. His face paled.

"I'm going to speak to Cross, Parker. I think we can beat them," and with Parker staring at him, Halliday went out of the room, down the aisles of the *Condor* to the room where a nervous, beaten commander strode up and down.

He looked up at Halliday brusquely.

"I have a plan," said Halliday simply.

Then as Cross listened open-mouthed, Halliday related slowly his idea for the crushing of the Martian menace. Cross' lips tightened as Halliday spoke calmly and the significance of the strange plan became apparent.

"It seems possible of success," he said slowly, as Halliday finished. "But who is to do it?"

"I am," Halliday answered simply.

Cross looked at him in astonishment. "But that's suicide, man," he said gently. "We can't allow you to do that."

"I'm the only man who can," Halliday returned quickly. "I am the only one who knows enough about the Martian camp to carry it through."

Cross was about to mention Parker's name, but thought better of it.

But he still shook his head. "We'll try it. But I'll get someone else."

Halliday's eyes flashed. "You can't," he stormed. "Listen, Cross. This thing is bigger than individuals. While we wait here, every hour another shell is helping to wipe our race from the globe. We must act now, man, act! I demand the right to do this."

Cross put up his hands hopelessly. "Very well. When will you start?"

"As soon as you are ready. How soon can it be?"

"It will take six hours to make the change-overs in the ships," Cross pondered. "Let us say seven hours." He gripped Halliday's hand. "My blessing goes with you, sir; you are a man in a million."

Despite the secrecy with which the plan was begun, it was not long before the earth camp was aflame with the news that a desperate sortie against the Martian gun was to be made. Groups gathered everywhere in the ships, and Nina, listening to their hopeful chatter, rushed to Halliday.

"What is going to happen, David?" she asked him fearfully.

"A man is going to take a ship against the Martian gun and explode it."

"But how?" Nina asked incredulously.

"The ship will be cleared of everything but the control equipment, and filled to the breaking point with our *hydroxine* rocket fuel. The ship will be driven directly against the Martian gun, and by the explosion of the tremendously powerful fuel on impact, not only the gun will be wrecked, but we hope the shells waiting to be sent into its chamber will be exploded too. If that can be done, a series of explosions will pass from shell to shell to rock the whole Martian camp."

NINA shuddered. "But that means death to the man who does it."

Halliday shrugged with an attempt at easiness. "If it isn't done, dear, we shall all die soon. What is one life against millions?"

"But who is to do it?" Parker, who had been listening, asked darkly.

"One of the young officers has volunteered," Halliday looked Parker directly in the eye.

Nina grasped Halliday's arm. "Take me to him, dear."

Halliday shook his head. "Impossible. He is very busy, preparing for this. Perhaps you will see him for a moment before he goes."

Slowly the hours passed, until the appointed moment when the "suicide jump" was to begin.

In the ships, squads of men moved quickly and purposefully about, tearing out pieces of equipment, installing others, moving carefully the great containers of the super-powerful *hydroxine*. During all these hours Halliday remained with Nina.

They talked and laughed a lot. Halliday was especially buoyant telling of what they would do when they again returned to an earth freed from the menace of the moon. To this Nina responded, but her thoughts seemed for the moment to be elsewhere. And to Halliday's questioning, she answered frankly that she was thinking of the young officer who was to give up his life for the race.

Halliday half turned away to control his mounting emotions, but then he grasped her hands.

"Come," he said, "we mustn't think about it, we must be happy." And under the spell of his unaccustomed eagerness, Nina was gradually drawn into his spirit.

The hour came, and in the deep hollow where the remains of the earth fleet lay, dozens of metal encased figures gathered for the last act of this cosmic drama. Apart from the other ships lay the *Kingsley* that was to alone attempt the conquest of the Martian goliath. To the southwest the mountain range lay clear in the void.

Halliday stood with Nina, both in their space suits. With disc phones on, they waited for the moment when the *Kingsley* should rise against the enemy.

Halliday was nervous. His last moment with her had

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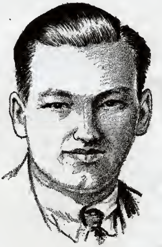
The Derelicts of Ganymede

By JOHN W. CAMPBELL, Jr.

(Illustration by Paul)

Suddenly the great ship struck it. The entire mass of the planetoid split; a great ball of flaming gas mushroomed out.

THE DERELICTS OF GANYMEDE



JOHN W. CAMPBELL, JR.

ALTHOUGH interplanetary exploration will produce situations in which the heroic, tragic, and dramatic in man will be brought out, it will also probably produce much that is quite humorous and whimsical.

Certainly the spectacle of men, used to the comforts of earth, being forced to adapt themselves to the conditions of some strange planet, may appear to some people as being tragic and to others as being humorous.

There is no doubt, however, that if man leaves the earth, travels to another world under which totally different conditions prevail, he may have to change his entire mode of conduct and his outlook. Qualities on earth that would make a man successful might entirely unfit him for the pioneering life on a new world; and the man unsuccessful on earth, may become a great leader on the new planet.

Mr. Campbell uses this idea in his story with great effectiveness. He has given us a very human picture of the "derelicts" that will not soon be forgotten.

DUKE STETSON deposited his bag and pushed his First Officer's cap to one side meditatively. He looked up at the blue sky. Then he glanced off toward thin, multicolored towers that formed the skyline of New York City in 2132. Tiny lines of crawling airplanes wound through them. Behind, and beyond lay the residential districts.

"Vacation, huh?" Duke grinned. "And now what?" He looked at the little blue slip in his hand. For the next six months he could wander anywhere he pleased on Earth's surface, following the Terrestrial Transport Lines free of charge. That and the six months' vacation were the due rewards of five years of steady work on the Terraluna Lines, owned by Lunar Beryllium. Behind him now loomed the shining, scarred hull of the giant freighter from which he had landed an hour ago.

"Well, Horace Greeley advised going west, so I think I'll try it. I need a little genuine 'ultra-violet.'" Duke stepped down through the customs and waved to a taxiplane.

"Terrestrial Transport," he called. In six hours he was in Los Angeles, and twenty minutes later found him registering at the Hotel Pacific in Santa Monica.

Then he started to enjoy life, light and liberty. It was quite a peculiar sensation to the man who had spent so many hours weightless in the eternal glaring night of space, to smell the salt tang of moist air, to lie in the softened warmth of a yellow sun on a beach of white sand, and to feel a constant weight on his body.

He was not long in finding friends, and even quicker in astonishing these Earth-bound mortals with feats of agility and strength they could scarcely believe. His lean six-feet-three of muscular body, trained to constant work and exercise of a space-officer, where weightlessness itself required the development of suppleness and of muscles unused on Earth, made him a deadly opponent in tennis.

But there was one girl who consistently defeated his best efforts. Joan Reading was not large, a mere five-four, but every muscle in her well trained body seemed to know where the ball was going next, and those laughing brown eyes never lost it, even when waving locks of mahogany-gold half blinded her. She was a fine player, but Duke began to wonder if it was altogether her playing that defeated him. He seemed to have unusual difficulty in following the ball. It was so much easier to follow her.

In five years as First Officer, and three before that as Second, Duke Stetson had had opportunities to meet many girls. But as the days of his vacation passed, more and more he found a something in Joan these others had lacked. Still—Joan was the daughter of John Russel Reading, and Reading owned Lunar Beryllium, owned it because it was his. He had made it, as he had made the first spacial freight ships, and the first successful space passenger ships. Old John Russel was known for getting just about what he wanted, and very little that he did not want, and Duke began to have an idea that perhaps, though he knew Joan was the one he must have, John Russel Reading would not want the First Officer of one of his own ships for a son-in-law.

For nearly seven years Duke had been working on a piece of apparatus designed to do what nothing known could do; penetrate Earth's blanketing Heaviside layer that reflected all radio waves and permitted none to pass. It made of every ship in the void an isolated world. No messages could be sent to Earth, nor to Mars or Venus either, since each had its enveloping, protecting blankets of ionized air. Moon, Phobos, Deimos, the astronomical observatories on Ceres, these could be reached easily from space by the enormous radio beams, but the major planets answered always with the eternal silence of space itself.

But Duke had studied the static that the enormous power plant, the Sun, rained down on Earth. That got through—perhaps—

He had worked on it, and had apparatus now that he believed would do the "impossible." And he felt that perhaps the inventor of the interplanetary signaling beam would be Old Reading's idea of a husband for Joan.

One of his six months was gone, and vacation was beginning to pall on him now. But for Joan it would have bored him long before. To a man who has worked unceasingly for five years in the depths of the Eternal Mystery and Night, the tiny Earth and her little, petty people begin to seem insignificant. One who has seen the eternal jeweled night for five long years, finds the poor, fogged nights of Earth, with their colorless, bloated stars quite uninteresting.

ONE evening in late June, he announced to Joan he was going to leave soon. They took Joan's little plane and flew out through clouds of rose toward a sun of red-hot copper sinking in a tremendous jewel, a pure aquamarine. Finally a little speck of green and brown appeared, and they settled down on the Catalina Island House landing.

It was dark when they finished dinner and walked over tiny pebbles that the patient waves, in the course of a few millenniums, would turn into fine white sand. Then they sat down and watched a glowing moon swim up out of the black sea.

"The Moon," muttered Duke with a grimace. Six years of avoiding meteors, first on his way to Earth's satellite, then from it, had not impressed him with its beauties. The Moon was a place that one tried to reach in safety, then worked to leave.

"The Moon," laughed Joan softly. "Once it was a big green cheese, and once it was a big silver platter. Now it produces three hundred and twenty three thousand tons of beryllium per annum, and the profits are quite large."

"Carried in the vest pocket of John Russel Reading, for future reference. That's the worst of it," he added, looking at her face.

A different glint had come over her copper-bronze hair, the light of the pale moon was distorting its colors. Even the crimson fire of the light beach suit she had worn was a shade almost black. It matched her lips, which flashed back in a smile as she turned to meet his eyes.

"Why, don't you want Dad to be successful?" asked Joan.

"Well," replied Duke, at length, "I'd be much happier if he weren't, I'm afraid." The pebble he tossed landed accurately on the toe of his left rubber moccasin. He continued to stare along the trajectory of the pebble.

The smile left Joan's face. "Why, Duke?" she asked softly.

Duke looked at her, opened his mouth to say something, found that it was quite unnecessary, and closed it slowly. He looked in her eyes for a little moment, then slowly pulled her over against him, and gave her a long, happy kiss. She snuggled down against his shoulder with a little sigh, and smiled very contentedly out across the water. Duke was looking down in uncomprehending wonder at the little body nestled down against him. Suddenly a little gasp escaped him, and his arms tightened about her convulsively.

"Oh—not so hard, you big bear!" she finally managed. "Won't do you any good to crush in a couple-two-three of my ribs, will it?" she smiled up at him.

"I—I—I don't know, Joan," he said shakily, rolling the name on his tongue as a jeweler might roll some magnificent stone between his fingers. "But when you lie there, so very small, so exquisitely feminine—and it begins to dawn on me that you are going to be mine forever—" He smiled down at the little upturned face.

"Well, for one of the brightest men your college ever turned out, you were certainly hard to convince," smiled Joan pertly.

The smile suddenly left Duke's face. "Why, what's the matter?" asked Joan, sitting up quickly.

"I'm second in command of a space freighter. That's the only source of income I have. If I know you aright, you are first in command of Lunar Beryllium, who owns the freighter. They have improved things a lot in the last fifty years, but people still need money to live," replied Duke dismally.

"Oh, Duke, if I *were* first in command of Lunar Beryllium, if I could move that dear old grizzly bear I have for a father, it wouldn't be so bad. But—well, I'll have to see him, and you have to start in a week you say. I think I'll speak to him tonight. Shall I?"

Later, when the small hours weren't quite so small as they had been, the plane hovered gently, almost soundlessly over the hotel where Duke was staying. The rustle of the air past the propellers continued for some ten minutes before Duke descended. For some time he stood watching the vanishing lights of the plane. Then he stretched heavily muscled arms up to the pin point stars, thinking how very, very lonely they must be because Joan was here and belonged to him.

Early the next afternoon there began a considerable roaring and raging around the Reading house on Berkeley Heights. John Russel Reading said a number of things when he heard Joan's latest plan, and Joan said a few more. But the tableau ended by Joan's reporting hotly to Duke that her father declared that Duke must have two hundred thousand dollars and Joan, or neither.

Old Reading was a strong-willed man, and he had learned through long experience that he had a strong-willed daughter. But he loved that daughter the more for it, and in his private opinion there was no male, himself included, on the face of Earth, or Mars, or Venus either for that matter, who was worthy of her. But he fully intended to see to it that the man who did get her was the best available. If he happened to be wealthy, that was luck. There was plenty of money in the family. But if Joan had decided that she wanted some man, he must find some reason for delaying her while he investigated. And the two hundred thousand dollars was the reason.

The worst of it was that old Reading had a very important merger plan on hand which would take him to Mars for the next three weeks.

And that meant so much delay in getting his investigation of Stetson started. But he had some private detectives started at work immediately.

Duke listened to Joan's hot denunciation of her father's ultimatum, and sat silently thinking, then he got up.

"Joan, that won't help us, dear little girl. I'm going to leave a bit sooner than I expected.

"I have a friend here on Earth who is with Photo-Communications in Boston. He knows some of the things I've been doing, and has some apparatus to use as receivers.

"I want to test the apparatus I have been working on. I think it will work. If it does—I may be able to buy out your father's holdings. If it doesn't—I still have some more theories.

"But I'll have to go to Phobos to test its ability to send messages to Earth. I must have a fair test. Earth has a good heavy atmosphere, and a thick, strong Heaviside layer, and the distance will be about fifty-two million miles. That will be a good test, since ships seldom operate at a distance greater than that from some planetary base.

"I'm too broke to buy passage to Mars, but I can buy passage from Mars to Phobos. I'm going to get a job on some freighter bound for Mars, and jump to Phobos from there. I guess that's the best way."

"Oh, Duke, how long will you be gone?"

"Haven't a notion. Three months at least."

Joan had a number of things to say about the situation, but she helped Duke get ready. She did a little private wire-pulling here and there, and because Stetson was not altogether unknown as a crack second in command, and because a ship was being fitted out for a hurry journey, Duke got a berth.

SHE was the *New Seattle,* registered of that Martian city, and a freighter of rather large size in her day, but better than fifteen years old. She was bound for the Transport docks on Mars to be cut up for her fifty-inch beryllium meteor-proof armor.

But what Duke did not learn was that she was traveling empty for high speed, and taking Reading, and some of his men along. Because the rocket motors were designed to drive the ship loaded, now that she was empty, they would be able to produce enormously high accelerations, and speed far greater than any normal space ship would make. A freighter without a load is a rather ticklish horse to ride, but old Captain Barnett had been in the business since the first "fire-monsters" went to the moon.

Duke had his apparatus very carefully stowed in his cabin, and was nicely settled, so he decided to stroll out and look about the take-off cradle.

He wandered about the ship, looking at the different rocket motors—a full dozen of them, far larger than those of the "ferry-boats" of the Terraluna Lines—and at the great space curving coils. He inspected the fuel batteries, the life boats, in fact every part of the ship, for two shifts of six hours in every twenty-four hours would find him in full control of the ship.

It was nearing the take-off time when he came up on the control bridge, and looked out across the crowded dock. Machines were working under the direction of tiny men, filling the tanks of the ship with air, water, fuel, oxygen, and a miscellany of liquids, solids, and semi-solids.

Aside from the laborers working the machines, there were few men about the dock, save customs officials, for there were no general passengers on this trip.

Anxiously Duke looked about from his point of vantage. Joan had said she would be here, and as yet he couldn't see her. Finally as he noticed the Reading family plane coming in for a landing, he hurried down toward the landing dock. Emerging from a mass of bales and crates he rounded a corner, and suddenly spotted Joan—with her father, and a group of important men!

He stopped, amazed, and when Joan saw him he ducked behind some crates. In a moment Joan joined him.

"Oh, Duke," she laughed, "this is going to be some trip for you! Dad, and some friend of his are going, and they are the real reason for the ship traveling empty. I didn't get word of it till this morning! He is using this ship because he will make better time. He has a conference on Mars, and James Kenneth Pahk-ah," she mimicked, "is going with him. He's president of General Foods, you know, that great big man that looks as though he owned the place."

"That great big man" weighed somewhere in the neighborhood of three hundred pounds, was very, very pompous, and realized to the fullest the dignity of his position. The other men seemed mainly secretaries and clerks.

"Oh, Lord, it sure is going to be a hectic trip!" grinned Stetson.

"And Dad doesn't even know you!" laughed Joan merrily.

Half an hour later they took off. Energy began to flow into the coils and the gravity-neutralizing field built up. Gradually weight left them and the ship floated up through the atmosphere till the black of airless space was about them. Then the great rocket motors began to speak, and the machine lurched forward. Quickly it gathered velocity until it was speeding meteor-like toward Mars, or where Mars would be when the journey was over.

Hour after hour the ship bored on, and the shifts switched. During his off periods Stetson worked on his apparatus. On his work periods he had plenty to occupy his attention. They were traveling at a speed that was considered high, even for the Planetary Lane Guardships, equipped with special, super-sensitive electro-static meteor detectors. Such high speed for this old ship, with its not-too-sensitive apparatus, was decidedly unwise. But—the owner was aboard and he had ordered it.

Parker did not understand what was happening, and if he did, it would not have helped. He only knew that he was terribly oppressed by the terrific, continued acceleration of the ship. They were using an acceleration of more than one gravity all the way, and his three hundred pounds felt as though it were three hundred and fifty.

CHAPTER II

Collision!

THE ruddy-green disc of Mars drew near finally, and the twin winking eyes of Phobos and Deimos chasing rapidly around it. Stetson was off duty as they drew near, and as the captain had taken over for landing, he decided to take a swim. A large tank of sea water from Earth was being brought over as their only cargo for use in a chemical plant, and the men had been making free use of it as a swimming pool. It would be a long time before he got another chance for a swim if he were on tiny Phobos. So Duke stripped and dived in.

The moment his body sank into the water, the excess weight he had been carrying slipped off. Floating in the water, the effect was the same as though he were on Earth, for the water buoyed him up perfectly.

For a few moments he swam vigorously, twisting and shooting through the chill water. Then he lay on his back and looked out of the port above him.

Ahead was the great disc of Mars, and on one side was the shining disc of Phobos, on the left and ahead as seen from the other port was rugged, contorted Deimos.

"Hmmm—mean position," he muttered to himself, thinking in terms of a space pilot. The not-too-sensitive meteor detectors would be almost useless in the enormous electrostatic fields of three huge bodies on three sides. And here, near a planet, where its great gravitational field swept meteors from their paths and drew them to itself, the danger was the greatest.

Barnett at the controls drove the ship on, however. He had orders—and he followed them.

But suddenly there came a crash—a single detonation it was so sharp—and a great mass of nickel-steel, tough as an armor-piercing bullet, and traveling perhaps thirty miles a second, smashed cleanly through the control room of the ship. It carried away the rocket control apparatus, and shorted all the electrical firing controls. The rockets, without control, opened up on full power.

Rocket motors, designed to produce an acceleration four times gravity on the ship when loaded to capacity, broke loose, when the ship was practically empty! The enormous power tore at the great beryllium fabric of the ship, and it groaned under the stress. The enormous, hardened girders creaked and strained, and the ship rocketed forward under an acceleration seven and three-quarters times gravity of Earth.

Stetson lapsed into unconsciousness almost instantly as the enormous acceleration weight pressed down on him. But the water he floated in saved him from death.

The men at their posts on the ship cried out once in agony. Their knees broke, their spines snapped, and they slumped down, broken things, under the awful pressure of the acceleration. They died instantly.

Stetson lived, unconscious, because he floated in water. Three other men lived. One was Reading. He had been taking a medicinal bath before landing. One was the pompous and overweight Mr. James Kenneth Parker, and he lived because he also was taking a bath. Had been taking one for hours. He had quickly learned that it was much more comfortable to lie immersed in water while the ship staggered under her load of acceleration. He had spent most of his time in his bath.

The fourth was an oiler. He was a wiry, lean man, about five feet six in height, and decidedly tough. He had been engaged in dredging a bucket of oil out of the oil bunker when the crash came. He had promptly fallen into the dense oil, and floated peacefully but unconsciously in its placid depths.

But every other man on board was dead.

The ship meanwhile had been observed. Men had seen it drive suddenly forward, and a Lane Guardship speeded after it in an effort to rescue its crew. But it was quickly distanced by the runaway before it was well under way.

Long, long hours later Stetson awoke, sneezing violently. He sneezed again. He gasped for breath and coughed out salt water. He opened his eyes, and they burnt. Desperately, half panicky, he opened his eyes after wiping them with his hands. For a moment he could see before the water rushed back. Then he drove his legs down, and sailed out and up. He wiped his face again, and succeeded in getting air into his lungs.

He was in the middle of a large sphere of water which had coated with rounded symmetry every article in the cargo tank. It also coated him, and hung in round blobs in the air.

Realization came. The rockets were exhausted, and weightless, the water by its adhesion had spread around wetting everything.

He struck the other side of the room, and carefully preparing himself, opened his eyes under the water, and swam toward the door. It was much easier to swim in the water than to work one's weightless way through the air. In a moment he found the door, opened it, and with a small globe of water burst through. Immediately he closed the door again, but not before a film of water had raced down the passageway.

ABOUT that time John Russel Reading was cursing most luridly as he floated weightless and helpless in his room. He had succeeded in escaping from his medicinal bath and getting into his suite. Finally he worked himself to a holding strap and turned down the little corridor to his study. The nervous little secretary was on the floor, but he would never be nervous again. Reading began to comprehend the magnitude of the disaster when he saw the secretary—a broken heap on the crumpled remains of a metal chair. The typewriter he had been using was floating in broken pieces about the room. Much of the furniture of the room had given way under its enormous weight.

Reading hastily put on some clothes and, half-dressed, stepped into the hall. His bell had brought no steward. On the floor was the explanation. Blood staining his neat white suit, his legs twisted at an impossible angle, lay the steward.

Reading was quiet, and began to look for perhaps another living man.

A lusty voice rang through the ship.

"Thank God! At least one other man. HALOOOO!" roared the business man.

In a moment two cries answered. One came from far down in the ship, and the second from somewhere near at hand. A moment later Duke appeared, clad only in his bathing suit.

"Mr. Reading!" he gasped in surprise. "Thank the Lord! Everyone else seems to have been killed, crushed by acceleration. I haven't found a clock on board still running. The lifeboat clocks will be working however. Built for emergencies. HALOOO!" he roared, as someone called from below.

"We have to find out where we are first," added Duke decisively. "We'll go to the control room."

"Who are you? How can you tell?" demanded Reading, inspecting the bronzed, powerful figure of the man before him. Duke hesitated to reply. He decided that life would be more bearable with Mr. Reading if he were kept in ignorance.

"Chief Officer—I was taking a swim when it happened— Oh, man! What in the name of heaven is *this!*" he stopped in amazement.

A magnificent figure garbed in dripping garments of a thousand hues, mostly the dark red of the heavy Venusian lubricant, stood before them.

"Am I as bad as all that?" grinned a streaked, quite unrecognizable face. "I took a bath in the lubricant tank, sir. I ain't had a chance to clean up."

"Oh, Lord, it's Bates!" laughed Duke. "Go clean up, and get some clothes. Get your stuff together, and pile it in Lifeboat Seven, that'll be whole, and it's the biggest. Take my stuff in as soon as you can, and perhaps Mr. Reading will want his necessities. Take only two things, two bags. But *get everything I have—we'll need it!"*

"Right, sir." Bates turned and shot himself down the corridor. Used to being weightless, he managed deftly.

Duke turned to Reading again. "Besides which, I hold Space Pilot's Papers. Get some heavy tough clothes on, and get ready. Then make sure there is no one else alive on board."

Duke turned and dived for the control room. Reading was a leader, not a follower, and for a moment he stood in exasperated surprise at the order from a young officer of the line he owned. Then he remembered that an officer knew a lot more about taking care of people in space ships than did business men. Quietly he got ready.

First, however, he put on some tough hiking clothes he had brought for a hunting trip he had hoped to make on Mars. Then he went about the passenger levels shouting. Finally he heard a groan, and on investigation found that Mr. J. K. Parker, of General Foods, was floating helpless and hopeless in the middle of his bath room. Parker was shaking all over his fleshy body. Little wavelets started at his neck and ran down his body, and died out at his ankles.

Finally Reading calmed him enough to induce him to struggle to the door, and let himself out. In a moment the room was flooded, for he didn't shut the door. Reading maneuvered him into the next room, and shut the door for him. Parker produced a white linen suit as his idea of "rough clothes." Reading picked his most suitable clothes, along with a stream of picked (and over-ripe) adjectives.

In the meantime Duke had succeeded in getting enough current from the emergency battery line to work the telescope. Quickly taking sights on the Sun, Jupiter and Mars he worked out an approximate position. They had started out from Mars in a tremendous arc, and curved up, out of the plane of the ecliptic, and now were curving back into it. They were headed for the center of the outer band of asteroids. The ship had perhaps as much as five minutes to live before it met with headlong collision at hundreds of miles a second with a mass of stone and metal weighing in the near neighborhood of fifty billion tons.

Duke turned, left the telescope, and calling to the others to leave everything instantly, raced weightless to his room. Three more boxes were left. One contained his clothes, one contained batteries, and the other some apparatus. Duke grasped the apparatus, lifted the massive box, driving rapidly toward the No. 7 boat with it. Bates was already there, with all the rest of the apparatus, but had neither his clothing nor Reading's.

THEY heard Reading's call, and explaining in three words, Duke took the controls, and sent Bates after the two men. "Asteroids—bring 'em."

Bates brought them. He brought them despite great objections on the part of Mr. J. K. Parker, who demanded clothes fit to wear. Reading came, because he knew what asteroids were, and had heard they were dangerous.

It was, none the less, four minutes later when Duke Stetson pulled the releasing lever. Automatic doors opened, and a powerful spring gear drove the little twenty-foot ship clear of the gleaming monster.

"Lie down," snapped Stetson. He seated himself in the carefully molded pneumatic pilot's chair, and as the protesting Mr. Parker was slapped down by Bates, he turned loose all the rocket power the little ship could muster. They curved rapidly away from the gleaming cylinder of the Mother Ship *New Seattle,* and turned to one side. Some thirty seconds later, racing now up and out of the asteroid zone, Duke shut off the power. The burdening weight of four times Earth gravity left them, and they looked toward the ship.

"Now listen here, young man. Do you know who I am? What do you mean by forcing me to leave that ship in such a precipitate manner, taking none of my valuable papers with me? I shall most certainly see that you are permanently suspended from operations," declared the Honorable J. K. Parker, his face wrinkled into what was intended to be a terrifying, avenging frown.

"I hope you can," sighed Duke.

"Oh, Mister Parker!" exclaimed Bates with evident anxiety written all over his guileless face and in his very innocent blue eyes. "You won't do that I hope. But surely you'll stay with us now? And at least you will wait to see whether or not you do get back, or whether you just starve to death in this little dust spot in the void. Or maybe a meteor will hit us. You know this ship has four-inch armor plate and the other had fifty," added Bates, warming up to his subject, as Parker's face turned slowly green.

"Ohhhhh—take me right back there!" wailed Parker.

"Watch it," suggested Bates, pointing out the little window. The gleaming hull, visible in the flashing glare of the sun of space, was shooting straight on, farther and farther away from them. Almost invisible in the black background of outer space a great, rough mass of rock was careening in its orbit, moving some eight miles a second, turning slowly on its axis. An enormous broken chip of a planet.

Suddenly the great ship struck it. Absolutely noiseless, the collision showed as an enormous flash of light and energy flared out. The entire mass of the planetoid split and was thrown all over space—a great ball of flaming gas mushroomed out.

A fifth of a second later there was only a faint glow.

"Ohhhhhhh!" Parker gave vent to a long groan.

Duke grinned at the window in front of him, while Bates brushed an imaginary dust particle from his quite immaculate suit. He had donned the suit he had intended to land in—his best and newest. Hence the toughest. These two, used as they were to space, were not awed and terrified by the immensity of its emptiness, and hence could better judge their position.

"Parker!" snapped Reading viciously. "You blankety blank blank yellow bellied, white livered, chicken hearted mountain of slobbering fat! Get up, and pretend you're a man, not a monkey. This Bates has been playing on you so you don't know which end your head's on, though it's hard enough to tell anyway. *Get up!"*

Parker got up. In a few moments Reading was treating him like a human being again, and the overwrought man was beginning to feel like one.

"Now—er—what's-your-name, where are we and where are we goin?" asked Reading. "Can we have a guardship pick us up in the next few hours, or will it take a day or so?"

"Guardships patrol the space routes between the inner planets. We are already beyond the asteroids, and getting farther all the time. This machine is equipped with a radio sending set that has no tubes in it, as I have discovered, and a receiving set designed for A. C. But the motor generator which should be driven by the battery, hasn't been oiled and it won't get up to speed, so I can neither send nor receive for a while. Even if the sending set were operating, we couldn't reach more than five hundred miles. These things aren't meant for long range. They are intended to bring the guardships to the exact spot, after they have been summoned to the general locality of the distressed ship. Big ships aren't supposed to smash into asteroids vou know."

CHAPTER III
Stranded!

"THIS ship is so very poorly tended to I'm surprised the rockets are full. They are luckily. Also the battery supplies are plentiful. Plenty of power, anyway. The inspection of these boats is the duty of the ground crews. My, the Planetary Transport must be wasting power on ground crews. I'll bet dollars to burned out battery plates that some fellow on the ground crew has a hum-dinger of a sending set," said Stetson sourly.

"Then we can neither send nor receive, and the guardships won't come?" asked Reading in alarm.

"Exactly right."

"Well, what can we do? What plans have you?" asked Reading, straightening up.

"All outer planets have been explored. Jupiter's uninhabitable, but unfortunately we are headed for it. We can just about stop the ship by the time we reach it. Of course, since it doesn't take any power to simply coast along, we could go to Pluto for all that, but we will just about be able to stop by the time we reach Jupiter, maybe. I haven't calculated the effect of the Sun's gravity, nor of Jupiter's. I'll have to use both to stop us, but the gravity apparatus is intact. With that we can neutralize, but not reverse gravitational pulls.

"With luck we ought to make Ganymede. That's one of Jupiter's ten moons. The biggest. The latest, the tenth, is so small they could never see it from Earth. Ganymede is bigger than Mercury, and, wonder of wonders, has an atmosphere very rich in oxygen, nearly fifty per cent, so that even though the pressure is very low, men can breathe it. That's where we are headed."

"Why? What can we do there?"

"Oh, an exploration trip starts out on a mineral hunt every few years. Jupiter and his moons are a good place to hunt. He's kind of big, and may have taken some deep skimmings off the Sun that the smaller ones didn't get. Therefore the rarer, heavier metals are more apt to be plentiful. There will probably be an expedition within the next four or five years," replied Stetson carelessly.

"Ohhhh," mourned Parker, "and when I get back Jimmie Blackwell will have taken everything I've got.

"Is there anything to eat there? I'm hungry. Is there anything to eat here?" he added more anxiously.

"Well," replied Stetson with a long face, "there are lots of things that eat there. Mostly plants. They have carnivorous plants, and insects the size of fox-terriers. The explorers reported that grasshopper steak was fairly edible, but rather tough, and flavored somewhat like duck that is just a little too high. Then there are lots of mushroom growths that make you sick for the first few weeks, but after that you can eat them with moderation."

"But isn't there any bread, nor steaks—real steaks?"

"But the worst of it is," continued Stetson, "that there isn't much water that's drinkable."

"Chief," reported Bates succintly, "I've opened ten cans of meat, and found one that wasn't spoiled too bad to eat."

"Let Parker try it if he wants to. His company supplies the Lines. On contract I believe. Must have made plenty on that contract, Parker," Stetson replied bitterly. The supplies were supposed to be renewed every year, but General Foods sometimes had a habit of missing a year or two.

"Yes—about a million and a half—but I can't eat this, it's moldy."

"How's the water, Bates?" asked Reading.

"All tanks full, but it's a bit old. Tastes kind of funny."

"No, Bates, it's all right. Just distilled," laughed Stetson.

The ship was well on its way now, and out of the danger zone, so Stetson set the controls, and began to take more accurate readings. Half an hour later he told the men that they should reach Ganymede in about four days. In the meantime he advised them to leave the spoiled food alone and stick to water and canned milk, which was supplied and maintained by General Dairies, and had been faithfully renewed every three months.

Stetson spent his time working on his apparatus, and in taking parts of the ship to pieces, and putting them together in a different way. When he got through he had a receiving set that functioned perfectly, and was three or four times as sensitive as it had been. Also the rotary converter was working again. But there was absolutely nothing coming through the ether in their direction, save the roar caused by the static of the unshielded sun.

The temperature of the ship had been falling, despite the many absorbing plates on the sunward side, and the silvered shadow side. Finally Stetson was forced to use some of the precious battery power for heat.

BY THE time they reached Ganymede's orbit the ship was still moving several miles a second, and the last of the rocket fuel was gone. Stetson settled down to work. He had to land the ship, and that meant he had to brake its speed. He used Jupiter's gravitational field at first, coming in on the gravity neutralizer, and so getting the ship close without increasing the speed. However, he built up a gravitational neutralizer field, and that energy had to be radiated before he could get weight to slow them. He threw it into the big resistor coils inside and outside. The ship was most uncomfortably hot for a change, but Stetson had his calculations exact. They fell into Ganymede's orbit with a velocity so low that it took them nearly four hours to settle through the atmosphere.

Nevertheless, due to the gravitational effects of some of the other satellites, which Stetson had been unable to calculate, they landed with too great velocity, and they landed on solid rock. The hull split open like a ripe melon. The air rushed out, and in a moment they were breathing Ganymedian atmosphere.

"Despite that crash, you certainly did a beautiful job of landing. It was mighty good work," conceded Reading.

"Well, in that case, I think you owe me for the passage. I think my bill will be ten thousand dollars apiece."

"WHAT! Charge us for this! I should say not!" roared Reading in instant defiance.

"Oh, all right. But I think you'll pay," grinned Stetson amicably. "Remember the last edible food is gone, and we have water for one day more."

While the two big business men looked at each other in amazement, Stetson and Bates stepped out.

"Say, Chief, did you mean what you said?" asked Bates in worried surprise.

"Absolutely," smiled Stetson. "I've got my reasons, and if we get back within six months I'll guarantee you ten thousand dollars. How does that sound?"

"It sounds like robbery," replied Bates doubtfully.

"No—just hotel expenses.

"Now look—do you see those big, broad leaf palms there? We are going to cut down a number of them, and build a shack before it starts misting here. When it mists it just rains up from the ground."

Bates and Stetson set to work. They cut down some of the huge, pulpy plants, and with the aid of some tougher material Stetson procured somewhere, succeeded in rigging a substantial and remarkably tight little dwelling in some five hours.

Reading and Parker watched with interest. Reading was too much offended to help, and Parker wouldn't have helped anyway. Immediately after its completion, Bates and Stetson started a task that, but for the lesser gravity, would have been impossible. They spent the rest of the long daylight bringing the fuel batteries and their oxygen tank leads from the ship. Then Stetson and Bates started out into the jungle. They were both exceedingly hungry, but Stetson had insisted that the batteries, and the important apparatus, be safely sheltered. Now they could go foraging.

In half an hour they were back. Bates had been astounded to see Stetson hurling small boulders a quarter of a mile. Then he had tried it and found that the combination of mass and small weight made it possible to push the stone harder as it left the hand, use a stone whose mass was really greater than the arm, and still not have it so heavy it couldn't be thrown. Stetson had been able to direct them unerringly after a few tries and had crushed a thing that looked like a large jackrabbit with black armor on. Stetson brought three of them back. Also he had some violently colored growths. He called them *Ganymedius stentius*, and claimed it was the correct name. Bates had his doubts. Also he doubted the edibility of mushrooms with colors so flamingly brilliant.

"We can eat 'em, all right. They are good, too," promised Duke.

"Well, I never saw anything good to eat advertising itself so promiscuously," replied Bates doubtfully.

"Apparently the things here can't eat them. They contain a thing unusual in Terrestrial mushroom growths, a true sugar. Sugars are alcohols, and apparently alcohols are poisonous to the animals here. Also, we can thank luck that no large animals, dangerous to man, have ever been discovered here," explained Stetson.

When they reached the camp, Stetson started a fire. Then he took a small knife, and opened the armorlike legs of the oversize cricket he had found. Inside was solid flesh, and despite stories he had told Parker, the meat was very good and quite tender. Its flavor was not strong, but quite different from anything they were accustomed to. However it gave out an odor, when cooking, that was detectable for amazing distances. Something like the odors of frying fish or bacon, or onions, it had the power of bringing the presence of an appetite acutely before the conscious mind.

READING and Parker had also been hunting. Parker had fallen into a mud hole, and was deplorably muddy. Then he had tried to catch one of the burrowing insects. He caught it but let go promptly, but not before it had done an amazing amount of damage with its powerful jaws. They returned empty handed, and most empty internally. Bates and Stetson were sitting before a warm fire that blazed feebly in the thin Ganymedian air, but looked quite cheerful in the night which had fallen. The odor of the cricket steak was even more cheering.

The business men appeared promptly. Parker had washed his hands, and bathed them with an antiseptic lotion on the ship.

"Ah—that smells good. I see you found something to eat, didn't you?" he said delightedly, waddling up in a most extraordinary way on this lighter planet. His face was colored a deep green by Jupiter's reflected light. The enormous disc of the planet was standing in the skies above them and visibly turning as they watched.

"Yes—it's good stuff, too. But very expensive," added Stetson. A piece of meat was broiling merrily in the skillet, and its odors wafted up to Parker's nose made him very hungry.

"Expensive!" roared Reading. *"What is this?"*

"This," replied Stetson with a sweeping gesture, "is the Hotel Ganymede. Lodging, five hundred dollars per night. Meals, all the same price, one hundred per each."

"You blankety-blank profiteering, brainless sap! You haven't the common sense of that animal you're frying. You haven't got the decency of your monkey uncle! You'll give us a share in that like human beings. We certainly won't pay!" exploded Reading, marching up to the fire.

"Ummm—Ganymede was claimed under the laws of interplanetary exploration by the United States. That makes U. S. colonial laws apply. This is a hotel, as shown by our sign. (He had set up a sign on a slip of paper.) Therefore lodgers are not forced to eat here, eaters are not forced to lodge, and no one is forced to do either," philosophized Stetson amicably, stirring the odorous contents of the frying pan. He dropped in a handful of chopped mushrooms, and a new and spicy aroma went up.

Reading stormed off in a rage. Parker stood around, and looked hungrily at the frying pan. Then he went off to speak to Reading.

In ten minutes they were back. The meat and mushrooms had just been taken off the fire.

"All right, you highway robber. I'll take it. I haven't that in cash. I'll give you notes," snapped Reading.

"Well, I guess your credit will be good for a few nights," conceded Duke blandly.

"You—you!" Reading started forward. Parker hung onto him, pleading in his ear.

"What's your name?" demanded Reading getting out his fountain pen and notebook.

"Oh, just make the bill out to Cash," suggested Duke.

"All right, and from now on I think I'll call you Bill. I can't think of any more appropriate name, since you won't tell me yours."

"That'll be all right, I guess. But—er—you see these notes you gentlemen gave don't pay Bill entirely. You still owe me $10,000 each for your passage."

It took nearly half an hour, in which time Bates and Stetson finished their meal, for Parker to get Reading back. Finally they came, but they were not going to sleep under that hotel's roof.

"Well, that's all right, I guess. But you see it's three hundred and twenty five per day with all meals, that's three meals, but it's three hundred for meals, and fifty for hotel rooming privileges," explained Stetson.

Parker sniffed hungrily as a new batch of cricket steaks and mushrooms were grilled. He ate with immense satisfaction, despite the notes he had handed over, amounting to eleven thousand dollars.

The two millionaires slept outside. That is, they started to. But when Jupiter's great blanketing disc went down out of the sky, the heat radiated away very rapidly, and water condensed out of the air on everything. They woke up soaked to the skin, and shivering.

They slept in the "hotel" where a fire was keeping the air too warm to mist. They paid a hundred dollars extra for making the proprietor get up in the middle of the night.

With morning, too very stiff jointed to move, Parker had to pay for day privileges. Reading went out hunting. He ran after several giant insects, but they jumped away from him with ease. His stones never hit them because he could not learn to control them under this lesser gravity. He was afraid to try the mushrooms for fear of getting the wrong kind. He saw insects eat them sometimes, and curl up and die almost at once. Whereupon the weird mushroom would slowly wrap itself around the insect, grow rapidly to seed, and burst with a pop that sent its tiny seeds for hundreds of yards.

CHAPTER IV

Tapping the Sun

HE RETURNED hours later very, very hungry. He had to pay for another meal, he knew. But he was willing to admit he was licked because the other fellow had experience and practical knowledge he didn't have. He was a business man, and he saw that as a food producer he was not so good.

He went to the ship first, and tried to draw some of the tasteless water. None came out. Parker had thoughtfully taken a shower bath, draining the last of the water. He paid plenty for that shower in the time to follow. There simply was no available water on the surface of Ganymede. It all remained in the air and came out at night, to evaporate into the air again in the morning. It was impossible to collect it unless, like a plant, one could take it out of the air.

Stetson had, however, solved the problem. He had taken the water tank from the ship, filled it with pounded leaves and other plant material, and started heating it. Steam came out. He collected and salted it till it had a pleasant flavor. It sold for one hundred dollars a glass.

He patented the idea. At least he claimed it was patented. But the others couldn't duplicate his method anyway, because he had the only available apparatus, and as the chief engineer of the ship, had a right to it.

Life was somewhat miserable for the two plutocrats. They were steadily becoming poorer. But Parker suffered most. He had to work rather hard, because he couldn't sit still. It cost too much to sit in the "hotel" and he couldn't sit still or go to sleep outside because the insects would come up and bite him. The ship was no refuge, they were swarming over it, and already dozens of mushroom growths filled it.

Reading was not suffering as much. He was busy exploring the section of the planet near him.

Bates and Stetson were working on the latter's apparatus. Stetson had made a queer set up that looked something like a daisy ten feet across. The golden center, however, was a flattened copper dome, made of heavy metal, and attached to a tremendously heavy copper lead about two feet long. It was almost as great in diameter as it was in length. The end of this massive copper block was approximately an inch from a second plate of two-inch copper. This spread out in a bowl three feet in diameter.

Around the two-foot length was a curiously designed coil of rather heavy copper wire, insulated from the block on insulite pins. At the gap between the heavy lead and the copper bowl three magnets were placed, one hundred and twenty degrees apart.

The petals of the daisy were made of thin metal plates, connected at rim and center, and insulated from the copper dome.

Leads from them ran to the apparatus set in neat rows on the floor of the hotel, and connected with the battery from the ship.

Stetson was ready to test it. Some of the material was already pulled off the roof when he called a halt, and instead ran long, long wires from the machines, out across the jungle, to a point nearly five miles distant. There he set up a very much simpler device resembling the daisy. It had petals, and the copper dome, and a very heavy iron bar, in fact a crowbar, ran down from it to the moist ground.

Stetson focused it carefully on a certain spot in the sky where the sun would be at the end of a given time, arranged a simple gyroscope from the ship to hold it that way, and went back to his machines. He started adjusting dails, and looking out across the jungle. Presently there was a flash, and a very pale ray reached out into the heavens, but it went in an absolutely straight line. It did not spread.

"What's that?" demanded Reading.

"It's a beacon to call the crickets so I can kill 'em easier," grinned Stetson. "But it may draw something else, so we had best lie down."

He watched his chronometer closely. After quite a time he shut off some of his apparatus. The beam stayed on, for the last piece had not been shut off.

Again quite a time elapsed. Then something came down that beam. It came down in a solid flood of incandescent fire. It came down with an explosive thud, smacked onto the planet, and did something. It continued to come for some two minutes. Then it stopped abruptly. Those two minutes were two minutes of terrific roaring, the ground shook and quivered, heat bellied out from the region in waves. Great tongues of flame shot high into the sky. Then abruptly it was quiet.

"It seems," said Reading somewhat shakily, "that you did get hold of something besides crickets, or else that was a lightning bug of a new kind. What did you do?"

"I set my choke too broadly. I have to use a band of less than one-thousandth of a cycle. I was playing tag with the sun, and the sun got rough," he added.

"The sun!" cried Reading, jumping up in surprise. "Do you mean to tell me you brought that energy across five hundred million miles of space!" Reading was thinking of what a nice power station the sun would make.

"Umhum. You haven't day rights, so get out and let us work," replied Stetson, looking absently off toward the smoking section which had housed the model of his larger plant here.

"Here's day rights," said Reading eagerly, writing out another note hurriedly. There were about three pages left in his notebook. They had been here three weeks, and the Hotel Ganymede was very expensive. It had cost him nearly sixty five thousand dollars.

STETSON accepted absently, and sat down and did some calculating. He ended up by connecting in all his apparatus to the large daisy projector. In half an hour he was ready. The business man watched silently.

A section of the roof was removed. Stetson trained his projector with sights mounted on it, and it remained trained by a finished clockwork attached to it. Then the beam started out. It was scarcely visible this time, but they waited patiently. After a very long time a sudden flash snapped out, and the beam was a solid column of energy stretching out to infinity, flowing bluish in the atmosphere. It was stopped solidly, however, at the gap where the three magnets surrounded the great copper conductor.

Stetson touched a key for the barest instant. A solid mass of flaming energy jumped across the gap, and struck the copper bowl with an audible thud. The energy seemed to flow through the bowl, then stream out in a dense cloud from the upper surface. It intermingled with the main beam, but seemed not to be troubled by that.

Stetson was grinning joyously. When he released that key the flame of energy across the gap was put out as though it had never been. Still that solid column of energy reached out to infinity. It was cold. No heat came from it. Parker, who had also decided to pay day privileges, got up and waddled over to it, stretching out his hand to touch it. Stetson, occupied, did not see him till almost too late. Then he struck him heavily with his arm, and sent the fat man rolling over on top of Reading.

"You suicidal sap!" remarked Stetson coldly, staring at him. "I don't know how much power that beam carries, but it carries enough to throw all of us to kingdom come and back. Stay where you are."

Carefully and with utmost caution Stetson approached the apparatus, and delicately adjusted the copper bowl, turning it at a slight but carefully measured angle to the main shaft. Mounted in direct coupling as it was, the clockwork would maintain it at the same angle to the sun that it now had.

Stetson returned to his key. He sat down and began to tap at it. The flame leaped and died, danced across the little gap, and the cloudy beam leaped and died in the copper bowl.

"I think it works. I'll take a chance on it anyway. If—" He turned to Reading, who had been watching with the keenest, though silent interest. "Want to send a message to the home folks?"

"WHAT—send a message from one planet to another by direct communication? Impossible. Never been done," barked old Reading.

But there was more of an air of challenge than of flat denial.

"Well—I'll tell you what I'll do. You two can get together and send a message to Earth, telling where and who you are. I'll bet they come. You can make out the notes this time so they will be good only if we reach Earth within three months," suggested Stetson. His eyes were laughing into Reading's. Beside him was the compact apparatus, the great bulk of the glistening black batteries behind the enormous daisy of metal. Above, and out to infinity, stretched that pulsing beam of energy, a flaming sword of infinite might. And all about was the tangled jungle of Ganymede.

"How much do you want, you robber?" demanded Reading. He knew what was coming by this time.

"Now let's see. It's five hundred million miles or so. Call it that. I'll charge the exceedingly low rate of twelve thousandths of a cent a mile. For that I'll send all the messages you want," said Stetson after a moment's mental calculation.

"Something's wrong, Reading," bleated Parker. "That sounds like a reasonable rate."

"Reasonable! Parker, that amounts to no less than sixty thousand dollars! Thirty thousand apiece!"

"NO!" he roared, turning to Stetson triumphantly. "At last we've got one thing we won't have to pay for. You'll have to send something yourself, sooner or later, you damn shark. I'll wait."

"Hmm—that's too bad," said Stetson with a downcast look. "I'd found that I couldn't afford to run the hotel on the present rates if I didn't put this deal through. I'll have to double them. Then, of course, you can stay as long as you like. I might say I believe it will take nine days for a guardship to get out here from Mars."

"You overgrown laughing hyena, you haven't the brains of an amœba, but blankety blank if you haven't got me licked. You win, damn your hide, because I'm a business man, and not yet used to plain robbery. All right, here." Reading paid up, and Parker, shaking all over in his anxiety, followed suit.

"Thank you, gentlemen. I am sure both my partner and I appreciate this. I suspect a guardship will call in about a week and a half." Stetson drew out his growing collection of notes, counted out ten thousand dollars' worth, and passed them over to the astounded Bates.

DUKE settled down to his key. The beam winked and flowed and flickered into the atmosphere and out into space. "Hope I'm using enough power, and yet I don't want to use too much," he mumbled.

"Four survivors of the Space Freighter *New Seattle,* having escaped in a life boat, marooned on satellite Ganymede of Jupiter. Have no suitable receiving apparatus. If these signals are heard, please send aid. Survivors are John Russel Reading, Los Angeles; James Kenneth Parker, Chicago; Joseph Bates, oiler aboard S. F. *New Seattle;* and Duke Stetson, Chief Officer aboard *New Seattle,*" ran the message. He sent it four times, while the other men watched the flickering beam in hypnotized wonder. Then the sun descended too low for safe operation, and Duke shut off the apparatus.

Day after day he sent the call, and further messages from the two men. Day after day he listened on his small receiving set for some word from the patrol ship he felt sure would come.

Nine days after sending the message first, he heard a faint response. In two hours it was audible.

"Calls received, stop sending. Signals breaking down insulation on power lines. End of message. Calls received—," came the message again and again. Duke had sent his position on Ganymede, so now he shut off his apparatus.

"Must have used too much power," he muttered.

Decidedly Stetson had used too much power. The first warning Earth had was a crashing static bolt that blew out static controls in several million radio sets, made meters in power stations jump as several thousand horsepower was suddenly thrown into the lines, and lightning devices flashed into action.

It was the sheer sharpness of tuning Stetson was using that minimized the damage.

The steady messages induced experimenters to try tuning them in for power. Several succeeded. One or two had heavy enough leads to dissipate the tremendous surges. Some secondary effect caused the natural static to tune in with Stetson's artificial barrage.

Power companies, whose lines unfortunately tuned in by natural length, were forced to suspend operations along those lines.

Earth had been distinctly disconcerted by Stetson's fourteen billion horsepower. Most of the enormous power was absorbed in the atmosphere, resulting in lightning discharges all over the night side of Earth, and a noticeable temperature change easily recorded by Weather Bureau instruments.

So the guardship with its powerful sending apparatus had beamed Ganymede, hoping to penetrate the small planet's light Heaviside layer, and so stop the signals.

The guardship appeared that evening. A blazing fire was their beacon. The long ship landed lightly directly in front of the Ganymede Hotel, and half a dozen officers swarmed out at once.

They met the survivors, and after a hearty welcome, the chief officer turned at once to Stetson.

"Good Lord, man, what was that thing you were using? The messages we have been getting from Luna for the last nine days have been one continuous howl for us to stop you. The first signals came through on a band so narrow that the meters couldn't measure its width, but they had such enormous power behind them that anything coming anywhere near your band simply gave up the ghost with loud wails.

"Even power lines that were somewhere nearly the right length were burning up in a blaze of glory. Your signal strength was estimated as fourteen billion kilowatts! How in the name of the Great Universe did you get that power? And how did you get it through the Heaviside layer. We couldn't even get it outside, your beam was so tight," asked the officer in wonder.

"Sorry I used so much power—I had no idea of it's magnitude. You see, I just tapped the Sun, and turned loose its static producing energies on old Earth. My signals were static really, but carefully tuned static. I—"

"Tapped the Sun!" cried the officer in amazement. "Lord, I thought you had a few million dollars' worth of ideas to get through the Heaviside layer—but tapping the Sun for power!"

"Officer," interrupted Parker, waddling up, "as an Interplanetary Patrol Officer, I demand that you arrest this man."

The officer, as a scientist and a space navigator, was much more in sympathy with the man who could make the Sun itself do his bidding than with the millionaire. "Why? What charge?" he demanded.

"Eh—er—Extortion!" said Parker with a grunt of satisfaction.

Chief Officer Talbot turned to Stetson who was smiling broadly.

"You see, Officer, I was running a hotel here for a while and my rates were a bit high to suit this man. But I didn't compel him to stay here, he was at liberty to move out." Chief Officer Talbot looked at the "Hotel," and began to understand.

"Hmm—how high?"

"He charged us a total of two hundred and ten thousand dollars for one month in that, and for sending that message," replied Parker, with a quivering rage. Reading was standing to one side looking on with a quizzical frown. He liked Stetson's grin.

"WELL, to tell you the truth, Mr. Parker, there's nobody else in the System who could have sent that message for any amount of money, so I really think that alone was worth it—if you wanted to go back. And if, as he says, you were free to leave—"

"Free to leave! Free to leave—and stay out in the cold and wet—and not have anything to eat?" snorted Parker.

"Well—there are no laws regulating hotel rates here that I know of—"

"Parker, come on. Let's go back and fight where we have some courts to fight in," suggested Reading, climbing into the ship.

The invaluable apparatus was carefully stored in the ship, and they started back. The fast patrol ship made the five hundred million miles in something under fifteen days. The atmosphere aboard was a bit strained. Parker was still trying to have Stetson arrested. As yet he hadn't found a charge that would stick. Reading was just sitting back and watching the progress of events. He was beginning to wonder about the possibilities of getting Stetson to sell him the patents on his apparatus.

They landed in Los Angeles. Quite a crowd had gathered, mainly scientific men, for the news of Stetson's discovery, forwarded from the patrol ship's powerful beam transmitter, had done more, and had been more thoroughly broadcast than even Stetson's messages.

The four men descended first. Parker waddled down with immense dignity. Reading came down the gangway with a firm step, anxiously glancing about for Joan. Joan was there. She broke through and ran toward the gangway with an expression of relieved happiness on her face—and passed her father with a little touch to fall into Stetson's arms.

Stetson and Joan were all alone. There were just two pairs of eyes, and two pairs of arms, and two young bodies in all the world. Finally Duke came to.

John Russel Reading was standing with feet firmly planted, and a quite indescribably mixed expression on his face. It was largely composed of amazement and suppressed amusement.

"Joan," he grated out. Joan snapped around, still holding onto Duke quite firmly. "Let go of him and tell me who he is."

"Ohhh—don't you know? He's Duke Stetson," she said with a look of surprise, pride and quite obvious possession. "An' he's mine!" she added with a look of defiance. John Russel Reading was just daddy to Joan, and his air of displeasure didn't bother her in the least.

"And I guess he's got that two hundred thousand now!"

"He most certainly has, and I know who he is. He's a highway robber, a holdup, the meanest specimen of—"

"Dad! He isn't. He's—"

"He's thinking it's time we went somewhere else to hold the family fight that seems to be brewing," interrupted Stetson, glancing about at a battery of televisor machines going full blast.

They went, in Joan's plane, the people thought. They actually slipped out, and wound up in the Reading place quite soon after.

"Now," said Joan decisively, "what do you mean by calling him all those names?"

With the labored patience of one who seems at the bursting point, old Reading explained what had happened at the Hotel Ganymede.

Joan laughed uproariously when he was through. "Oh—he put it over on old Dad! You can't call him names, he just beat you at your own game—and got the two hundred thousand you told him to. Ohhhh!"

"And since I have the two hundred thousand, I wonder if you still think that possession of dollars is a proof of good character and ability?" asked Stetson quietly, little torn pieces of paper raining down from his hands. The notes were quite permanently gone.

"Hmmm—teaching the old man a lesson, eh? Well—you did with a vengeance. You taught him a lot of other things. I said that two hundred thousand because I wanted to have a chance to find out something about you, before you married my Joan. I thought it might hold you up for a while, instead it seems I was held up," added Reading ruefully.

"There's something I want to ask you. Are the patents on that device for sale?"

"They are—but you can't pay for them. Somebody else has to help you," replied Stetson.

"Huh. Now what kind of a holdup?" demanded Reading sharply.

"Oh, you've got to give me your daughter, and she has to say yes," grinned Stetson.

THE END

Welcome to Mr. Brandt

IT IS with pleasure that I introduce to the readers of WONDER STORIES an old friend, and one of the greatest living authorities on science fiction.

Mr. C. A. Brandt has, for many years, collected every available science fiction story in print that appeared in the English, French and German languages. He is thus an international authority on the subject.

In 1926, when I originated AMAZING STORIES, I engaged Mr. Brandt as Literary Editor on the staff of that magazine, in which capacity he remained for a number of years.

With this issue, Mr. Brandt becomes Literary Editor of WONDER STORIES and WONDER STORIES QUARTERLY, and it will be the means to make these magazines still better as time rolls on.

C. A. BRANDT

Having read everything that has gone before in science fiction, Mr. Brandt is an excellent critic on science fiction in all its phases, and I have always been able to rely on his clear judgment.

I am happy to welcome Mr. Brandt to WONDER STORIES and WONDER STORIES QUARTERLY, and I feel certain our readers will be glad to hear of the addition to our editorial board.

Hugo Gernsback

The Duel on the Asteroid

By P. SCHUYLER MILLER and DENNIS McDERMOTT

(Illustration by Paul)

Slowly Gulliver's body turned in its flight. Slowly he neared the mass beneath, spinning end over end.

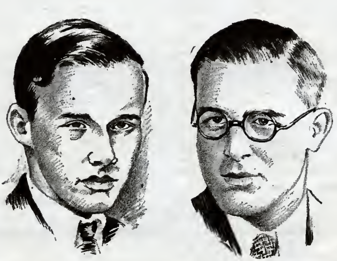
THE DUEL ON THE ASTEROID

By the authors of "Dust of Destruction," "The Red Spot of Jupiter," Etc.

MARE SERENITATIS! Drear and desolate the vast grey plain stretches to the eastern horizon, where a blinding sun is slowly climbing the black heavens in the long lunar morning. To south and east the tops of mighty mountains are touched with light—the Haemus, and the lunar Apennines—and the light of morning streams through a mighty strait into the arid "Sea of Rains," touching the towering bulwark of the Caucasus and, beyond, the twin craters, Aristillus and Autolycus.

Here and there on the floor of this waterless "sea" rise the folds of great mountain-chains, huge, yet dwarfed by the mighty ranges of the horizon. Here and there are craterlets, larger than any of Earth. Across the desert of ash spears a broad white lane, born half-way across the Moon, on the pitted flanks of Tycho, mightiest crater of the South. Nowhere is there life or motion, save in the long shadows that creep with the mounting sun over the ashen plain.

"Sea of Serenity!" No breeze has stirred the thick ash of its floor for untold ages—no life has decked its mighty mountain-slopes with the green of spring, or gentled their ragged ledges. Yet the morning sun casts strange, new shadows over its desolate expanse, shows tiny new craters, strangely oval, like nothing any telescope has shown. They stretch into the sunrise, a line of little pits sunk in the fine volcanic ash of the sea-floor, and now, where a long, low ridge rises against the sun, two glints of light flicker and are gone—moving light!



P. SCHUYLER MILLER **DENNIS McDERMOTT**

> *THOSE who read "The Red Spot of Jupiter" by Dennis McDermott saw clearly that a new character in fiction, that of Lem Gulliver, had been created. Now the versatile P. Schuyler Miller has combined with Mr. McDermott to carry on the fascinating Gulliver series, which will take us the length and breadth of the solar system.*
>
> *In this story, the second of the series, we get a marvelous insight into some of the mysterious places of the solar system, and the possibilities they hold for strange adventures of all kinds.*
>
> *Gulliver is a hunted man, yet the fault is not his own. In this story we will see him at his best and at his worst, in a drama of the great interplanetary spaces that extend clear across four hundred million miles.*

Straight as an arrow the line of footprints steers its way across the level waste, past crater and over ridge, plowing through the thick dust toward the beacon that gleams on the far horizon, nestling between the mighty pillars that flank the strait. As they near it, the grey ash of the desert pales to white, and the shadowed footmarks stand out as against old snow. Slowly they mount the gentle slope of the little crater, pass over its rocky summit, and are gone.

A hundred miles behind their prey, two Earthmen struggle across the plain, adding new lines of pits to that which they follow. Men of the Lunar Patrol, they are, bearers of law and justice to the wastes of Earth's Moon. And they track a man known to all the Solar System for his lawless daring and bold defiance of the Patrols—Red Tonti, for fifty years the terror of the space-lanes! Brave they are, with the bulldog courage of Earth, relentless and untiring in their pursuit. A hundred miles—in eight hours Tonti can be lost forever in the lunar labyrinth, yet they trudge on under the blazing sun, sealed in the muggy heat of their space-suits—dogged, and hopeful.

For hours they have scanned the jetty heavens and sent forth their call for aid, in vain. For hours they have trudged across the waste, bloodhounds of Space, tracking down their prey. And now, out of the spangled black, hurtles a metal meteor, belching red flame, to curve and check and fall with a slow burst of fluffy ash to the floor of the Sea of Serenity!

A giant form steps from the opened port of the police-ship into the full light. Of all Earth's sons, only three can claim his bulk and stature—Black Lem Gulliver, outlaw of Space, Red Tonti of the Moon, and Giles Wreyburn, chief of the Lunar Patrol—giants all, in a race of giants! Tonti is old, and Gulliver is marked by old wounds, but young Giles Wreyburn has but twenty-five earthly years to his score, and his record, like his giant's body, is without blemish.

Beside the ship he waits, scuffing the ash impatiently as the two hunters of men quicken their swinging stride and approach. There is no salute—the Patrol has long since dispensed with its formality on all but dress occasions, in review, or to very high officers. He snaps the cable of his phone into the socket on the helmet of the taller man—speaks:

"What report?"

"Eight hours ahead, sir. He was laying for us in Dawes, with three of his gang. We got his men, but he cornered us, tied us up, and struck out across the plain in our ship. He crashed, near the streak from Tycho, and we got loose and followed. I think he's bound for Linné, sir—Schmidt saw changes there, back in 1866, and Pickering verified them. There's probably an outlet there, where he can get down in under."

"Enough! He has not changed his course?"

"No, sir, He—."

"Good! Report to First Officer Lennox, on board ship. He will unship my flyer, leave me Rathmon, and return with you to recruiting quarters."

"But, sir—."

"You heard me! By the Law, you rookies 'but' too much! You've lost your man. Take time out, and *get* him the next time!"

The two crept silently into the ship, a mite crestfallen. After all, it had been four to two, and an ambush at that! And there had been a time when the Chief was as green as they, when Lem Gulliver had made him the laughingstock of all Venus! Glumly they gave their message, then crawled aft along the axis-tunnel to their coops, among the firing chambers.

The belly of the police-ship opened, spawning the neatly streamlined form of the Chief's pet flyer, *Hesperus,* scarred and dented, patched and welded, yet serviceable as no other ship of its kind in all the System. It traveled free—without air, now, and lying full-length in its control-chamber was the muffled form of Rathmon, the Venusian dwarf, friend and blood-brother to Wreyburn. The giant pulled open its snug hatch, squeezed through, took over the controls. The *Hesperus* quivered with the thunder of her jets, leapt from the floor of the ancient sea, and vanished over the curve of the horizon. A moment, and the rockets of the mother-ship sang their song of power, and drifting pumice, settling into a line of shadowed footprints, alone marked the spot where life had disturbed the ancient rest of the Sea of Serenity.

AS HE slid down Linné's steep inner wall, Red Tonti gave vent to a vocabulary of sixty years of rare and ripe experience in the System with a string of oaths intended to signify supreme relief. He was gettin' old! Like a weak-livered fool, he'd let those two rookies go, an' they were probably trailin' him now, bellowin' like calves for the Patrol! Well, let 'em bellow! *He* was safe enough!

In the shadow of the wall, the crater-floor gleamed wanly white with delicate frost-crystals—frost of frozen air! Chuckling to himself, Red scraped among them with a mitted hand, feeling about under the frost and ash for the bed rock. There! A little to the left, and more toward the center, in line with that split ledge—ah! He had it! Like a dog, he fell to digging, throwing up the glittering stuff in a veritable shower.

A vent was here, from which air seeped and froze, barely large enough to pass his body. Eagerly he plowed into the crystal drift, deeper and deeper, wedging his huge frame into the hole as he dug. Now the frost was falling back, covering him, hiding his retreat from prying eyes. The crystals were growing larger, and more loosely packed—the vent was widening rapidly. He tried to brace his feet against the walls, slipped, scrambled wildly as the thin white crust gave way, dropping him into a wildly boiling cauldron of thick liquid!

Whew! No fun, this swimmin' in liquid air! The damn stuff boiled like a hot spring as his space-suit touched it, even if he *had* been ramblin' around at two hundred below, Centigrade! He couldn't see to swim, with that froth of bubbles all around him. Nothin' to do but wait—sit an' wait for his suit to cool off enough to stop heatin' up the stuff, *then* get out.

He sank through the frothing fluid toward the bottom of the pool, the boiling slowing as his space-suit ceased to give up heat. The cauldron was really a huge siphon, where air oozing from the labyrinths beneath liquefied and choked the vent, freezing at the surface where it opened into the crater of Linné. Now, as the bubbling stopped, Red began to plow an unwieldy way toward the surface. Wait! Why try to dig out the crack up there? Why not dive under the separating rock wall an' come up the neck of the siphon into the other pool? Sure! Red Tonti acted as he thought, swiftly, and with all the power of his great biceps behind his strokes, he was clawing his way to the ledge that separated the two pools, and writhing up through its tortuous neck to the mouth of the passage leading to the depths.

Crawling out, he stood for a moment, looking about him. Under the chill of the liquid air, some of the organic substances of his suit were luminescent, glowing weirdly green, bright enough to show the walls around him dimly—a low-roofed chamber in the glassy lava, an ancient volcanic vent, with the black mouth of a low passage opening downward and a narrow, frost-choked slit in the roof showing the hidden way to the other chamber.

Funny—with all this air in here, sound carried pretty well from above. No need to listen for footsteps on the crater-floor, though—those big-nose rookies were too far behind. No need—*what the hell!*

The little chamber rang with the clang of metal on rock as the *Hesperus* dove to the crater-floor. Squeezing through the port, Wreyburn looked around. Curse the luck! In this damned frost, Tonti's tracks were gone—clean lost. But they ended at the crater—he was here, somewhere!

A tug at his elbow—Rathmon. He stared down at the pale, godlike face behind the quartz of the space-helmet. Tough, that such a man should be a crippled dwarf! But Rathmon was plugging in his cable—he had something to say!

"Giles, friend, I have planned something."

"A plan, Rathmon? What is it?"

"This frost—it must hide in itself some cleft of the rock where this man has hidden. We cannot see. But I am clever with the ship—I can burn aside this frozen stuff with the blast of the jets."

"Great, Rathmon! You're a wizard! But can you hold the ship?"

"You may trust me, I think. And you?"

"I can stand the heat if need be. I'll wait on the wall here, until I see the vent. It can't be far. Come—let's get started!"

A difficult job, this balancing the force of the rockets against the gravity of Earth's satellite! High on a fountain of scarlet flame rode the *Hesperus*—a fountain that scourged Linné's little crater and swept the frost from its floor with awful heat! For an instant Wreyburn stood on the pit's rim, scanning the rifted floor, then, eyes ablaze and guns ready, he dashed unheeding through the storm of fire to where the vent was belching dense clouds of air! His suit glowing red with the heat he dived into the geyser of air—his feet found the edge of the vent—he was sliding down toward its hidden bottom! He had reached it, and was scrambling up through the dense white fog into the other arm of the passage, a passage down which a second armored form was scurrying in flight!

Red Tonti had heard the clang of the landing ship, the muffled footsteps of the two men, then his grin of triumph turned to angry dismay as with the drum of rockets that should have signaled the ship's going came sudden, fierce heat that set the limpid pool into a fury of boiling, belching out clouds of fog that blinded him utterly! Cursing savagely, with the ring of running footsteps in his phones, Red Tonti dove for the tunnel, caromed off the wall, tottered on the brink of the pool, then found the opening and scrambled headfirst into the dark, seconds head of the questing big-nose!

Flight! In the rat-holes of New York, in the jungles of Venus, in the squat cities of Mars men were fleeing in fear. Deep under Linné, Red Tonti squirmed down through a tortuous, glassy-walled shaft into the Moon's heart, a giant fleeing from a giant. Above the glowing eye of Jupiter's Red Spot, Black Lem Gulliver was wresting his little ship from the savage tempests of the up-draft and striking up and out into open space, fleeing from the hungry clutch of the giant planet. Crouched in a rocky crevice of an uncharted asteroid, a frightened girl sought to evade the bestial ravening of a crazed Venusian. Three fugitives, separated by millions of miles of gaping void, whose fates were destined to mingle within short days of Earth's time!

Captive of An Asteroid

JUPITER'S last moon vanished in emptiness as Gulliver hurtled out into space,* every jet of his stolen ship at full throttle, their thunder driving him fiercely against the metal floor of the control cabin. Out, mile after mile, hour after hour, widening the gap between him and the great metal space-city of the police, *The Titan,* guarding the outer System. Soon they must learn that Gulliver was free, his captors dead, and then the void would fill with their questing ships, hunting him down! Minutes were precious, now, for they meant thousands of miles at the terrible speed at which Gulliver was hurtling toward the sun!

Between Jupiter and Mars spreads the belt of the asteroids—shattered remnants of a dead planet. The great liners of space rise above their plane, but Gulliver's fuel was fast being consumed by his terrific acceleration, and his course lay straight through their death-dealing maze. He must trust to the warning of the charts, and play force against force and mass against mass in a game of life and death—awful death in the heatless void of open space. They were all about him, the light of the sun gilding jagged crags and shining through great chasms. Before him they were black, ringed with flecks of light, and as they swung past, the light reflected from their faces showed them as travesties of planets, rough and tiny, like fragments of a splintered boulder. Some were giant oblong bricks, toppling end over end through infinity, some mere flecks of cosmic dust, yet all clung to the path of the planet that had given them birth.

Ever and again two planetoids would jostle soundlessly and crash in blind destruction into their fellows, ever and again two would meet and wheel warily about each other, then swing on in altered paths—everywhere was change and pending ruin. Little was needed to shift their delicate balance—even the gravitational drag of a speeding ship of space would be enough, and was!

In the cabin of his little ship, Lem Gulliver stared into the void, grimly, scanning the livid disc of the sun, where dark shapes and fleeting shadows passed, asteroids swarming between him and safety! The space-chart was a maze of streaking green, where a crimson dot miraculously threaded an untouched way. A master's hand on its controls, its rockets flamed again and again in doubled fury to swing it aside or check its mad rush through space, then whip it back into its course. And now, at long last, the radio chattered and spoke in sharp query.

"Police-ship *Altis!* What is wrong? Police-ship *Altis!* What is wrong?"

Over and over the question blares from the speaker and Gulliver grins in derision. *He* is wrong! Much good may it do them to know it!

They've quit now—are sending out a general warning. They're not so dumb at that! Must be someone there who knows him and his reputation!

"Patrol-ships, attention! *Altis,* bearing Gulliver, does not answer. Search the asteroids for wreck or fleeing ship, probably sunbound. Do not parley! Attack without compunction!"

So they think they can get *him?* A pretty game, this hare-and-hounds of space! Suppose the hare leaves a little clue—they'll not be expectin' it, an' it can't hurt. Suppose he plays with 'em a bit, shows 'em what kind of guy they're dealin' with! He flips over the transmitter-switch—bellows his challenge to all space!

"Hi, you big-nose hounds! Come an' get me! Lem Gulliver speakin' from the *Altis.* You can pick flowers for your pals—there's lots of nice ones on Jupiter!"

That'll stir 'em up! By the Almighty, they'll be buzzin' around like a nest of hornets, fightin' mad an' as helpless as babies! Let 'em come, if they can find him! He can work a ray with the best of 'em! It'll be a party—a kids' party—an' he'll be givin' it!

Roaring with laughter he turns off the transmitter, flips the deflecting lever over a notch to dodge a small mountain in his path, grins contentedly as the rockets mutter answer—curses savagely as they die! The fuel is gone! He kicks over the refuel lever, jockeys the throttle! Damn it—*they don't answer!* The gauge still registers half-capacity—can't be that. Then into his brain flash the words of the dead big-nose, Bill:

"If you have to use full power to get clear of Jupiter, we may not make *The Titan!*"

God above, he'd used every bit of power the ship could give, an' here he was thousands of miles beyond the space-city! That damn gauge! He hammers it with his fist, then with a savage kick tears it from its post! The needle was jammed—in the crash on Jupiter, probably! The fuel is gone—all of it—and all around him loom the hurtling asteroids! He's trapped!

Madly he stares into the void. Has he a chance? Is the swarm thinning? His answer comes as with an oath he springs for the controls, flings open the port, and is belched into space with the rush of pent air from the ship! Dead ahead looms a mighty twin planet, great rocks three hundred miles in diameter spinning about a common axis. For a moment he is borne along with the deserted ship, then the nearer mass reaches out, seizes him, swings his body into a long orbit as the abandoned ship crashes headlong into its twin! A tiny helpless figure muffled in a glittering space-suit, Black

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*See "The Red Spot of Jupiter" 1931 WONDER STORIES

Lem Gulliver wheels through emptiness, captive of an asteroid!

On the moon, meanwhile, deep under the surface of the *Mare Serenitatis* the lava vent opened into a weird underworld. Headfirst, mittened hands vainly clawing for a hold on the glassy walls of the tube, Red Tonti shot from a little hole halfway up the cavern-wall and crashed to the rocky floor. Stunned, he lay for a moment gasping, staring about him. Twenty years since he was here last!

Above, the roof is hidden in blackness, but walls and floor are alive with wan white luminescence, green-tinged and feeble. Down the ledged wall trickle streams of moisture, and where they wet the soft rock grow colonies of lichens, flat and pulpy, with great white spore-cups that glow eerily. The floor is wet with glowing slime, where soft, flabby monsters writhe and wriggle hungrily. For perhaps ten seconds Red has lain there, and now as he struggles dizzily to his feet his groping hands sink wrist-deep in the avid mass of life that has been creeping to him, eager to feed! One clings to his arm—a great, pale slug-thing, oozing green light, that mouths the joints of his armor and spatters with his angry blow, leaving thick slime that drips slowly from his fingers! Another of the damn things is on his helmet, sucking with flabby lips at the quartz. He can see right through it, into its belly—see the horrid writhing of its gut as it sucks at him! God! How can such things live? Give him space, and the planets!

HERE in the festering bowels of the Moon there was sound again, and Red's boots squelched sickeningly in the luminous morass of foul life as he hurried to the low corridor opening from the cavern wall. A pale white glow lit the whole length of the tunnel, to where it opened into darkness, high on the wall of a great underground vault, cleaving the body of the Moon for mile on mile. A viscid trickle of glowing ooze lipped over the ledge where the tunnel opened, and fell into eternal darkness, down, down God knows where or into what Hell's paradise of living light!

Along the narrowing ledge scuttled the shadow that was Red Tonti, hugging the wall and groping in emptiness with his free hand. There! With a rasp of metal on metal, he seized the steel cable that hung in the blackness of the abyss, tested its strength with a powerful arm, then swung out over the pit! Twenty years since he and another passed over this trackless trail, death of a different sort at his heels! Few men knew it, and few who had known could tell!

Down into the thick dark he slipped, swinging out from the face of the cliff—out, and back under the overhanging ledge, and out again! The cable ended a hundred feet below the tunnel mouth, and he dangled from the noose spliced at its tip, swinging in an ever-growing arc above bottomlessness. Back and forth, back and forth, until his mind throbbed with the beat of the pendulum that was himself, until the undercut wall of the chasm swept close, and on the out-swing there came a sense of nearness to some unseen bulk! Then, flinging every atom of his great strength into one mighty effort, Red Tonti sped into the dark, out and down for thirty feet to the rocky tongue that thrust from the wall of the abyss to break his fall!

Cold sweat soaking him, terror pounding in his heart, he lay there in the blackness, clutching at the rock that was life and freedom to him, then started to his feet, tottering above the precipice, staring at the ball of white fire that drifted down from above, sending little shadows scurrying along the face of the great vault, outlining his startled figure against the black mouth of a corridor, and far above him another metal form, gripping the swaying cable and staying its wild motion!

Then, as the flare died and darkness rushed up from the abyss, two narrow fans of scarlet light seared the thin air, two rays of fierce heat stabbed into the dark, and the cable began to sway anew, while a hundred feet below a cursing form was creeping away from the chasm, into the shelter of a crevice in the face of the precipice, a hunted creature seeking its lair!

Out of the blackness was born a thing of fighting fury! Out of the shadowed maze of the tunnel's roof dropped a dwarfed form, cased in bright steel, crashing upon the fleeing man and bearing him to the floor, beating with mailed fists at the tough quartz of his helmet, screeching in mad frenzy! Rathmon, the dwarfed Venusian, would avenge his master's death!

There in the close dark, rays were useless. Man to man, beast to beast, they fought, ravening, insane, a cornered ferret and an avenging ape! Only the clang of metal on metal broke the stillness as blow after blow rained home upon lifted arms, missing by inches the crystal of a helmet! By sound and blunted touch they fought at the Moon's heart, and now Rathmon's dwarfed form was failing under the giant's onslaught the advantage of surprise lost, his arms weakening, his gnarled legs stumbling, a dim red mist creeping through the blackness! A moment he rallied, driving Tonti back with a mad hail of blows, then as the outlaw surged in recoil the Venusian tottered and crashed senseless to the floor!

Red Tonti drew back his steel-shod foot for the kick that would bring agonized death in the thin air, to fall under the hurtling projectile that shot from the tunnel mouth, striking him full in the chest, toppling him, to stretch him unconscious among the rocks! Giles Wreyburn had not died. And Rathmon—Rathmon who had gone by another route to lie in ambush—Rathmon who had thought his friend and master slain cruelly, and sprang like a tiger to the attack—Rathmon lay still and wan beside the *man* he had fought to the end.

Two hundred and fifty million miles from the little crater where a red-headed giant, threatened by the rays of a second giant, was carrying a shrunken form to the shelter of a little ship of space, Lem Gulliver floated in the void, prisoner of an asteroid. He was toppling slowly, heels over head, turning about his own axis, as he swung in a long ellipse about one of the twin planetoids.

Below was a jagged surface of splintered rock, great spires of granite and black, columnar basalt thrusting up at him, awful chasms yawning in the rocky wilderness, a few narrow plains opening among the peaks. With every turn in his orbit, his captor's twin dragged at him, pulling him to it, speeding him on his way, drawing out his elliptical orbit and twisting its plane through space until hope came to him again. For as his orbit lengthened and narrowed, his helpless body crept ever closer to the peaks of the little world beneath! With solid rock under his feet, Black Lem Gulliver knew no master!

The Strange Duel

THE twist of his orbit had brought into view a new part of the asteroid's face—a region where a peak mightier than any he had seen split space, reaching up at him, mile on ragged mile, its flanks scarred by rifts as black as the bottomless chasms of the Moon. On its sunward slope, cut off by great cliffs of shattered basalt from the rest of its great bulk, was a little plateau, smooth and level, perhaps a mile in breadth and twice as long. Lying against the base of the upper precipice, crumpled into well-nigh unrecognizable wreckage, was a ship of space, about whose torn remains an armored figure prowled!

Hour after hour Gulliver swung in his prisoning orbit, drawing slowly closer to the great peak at whose base the wrecked ship nestled. Time meant little to him now—could mean little in the timeless void—but it must have been two days that he swung there, low over the peak, staring at the forbidden haven so near and yet so far beyond his reach. Twice, when he returned, the prowling being was still near his ship, then he had vanished, and Gulliver cursed in angry impatience. Somethin' damn funny was goin' on down there an' by God he ought to be in on it!

Gulliver's luck, famed throughout the Solar System, held good. A scant two hundred feet beneath, the topmost crag of the giant peak swung close, and Gulliver ceased his frenzied cursing to act! He wrenched the heavy lead from his steel-shod feet, unclasped the belt of steel mesh that held emergency rations and fuel. Food and drink he would find in the wrecked ship. His gun and belt of charges he retained, for there was going to be trouble, with him in the middle of it! He had plenty of time to gauge his forces, then the crag appeared again and he tensed, gathered his garnered weights in a little cluster above him, and with a muttered oath hurled them into space! Slowly Gulliver's body turned in its flight—slowly he neared the mass beneath, spinning end over end,—then he burst into a frenzy of bitter invective as the peak swept by barely ten feet beneath! Gulliver's luck had failed!

But had it? The peak was *above* him now—his orbit had tilted to bring him down in a long slope past it, close to the face of the little planet! He had missed the peak, but by all the gods of space *he would land in the mountains opposite!*

With deadly slowness they crept toward him, dropping away as the quick curvature of the little planetoid bore him higher above its surface. Bristling crags thrust up on every side, and now one giant spire, very little lower than the mountain of the ship, barred his way! Slowly he approached it, in a long upward slant. Slowly it fell away beneath him. Then the topmost pinnacle of the range swept toward him and his heart sank in black despair! The ruse that had brought him close to the asteroid's surface had only augmented his helpless spinning. His feet would graze the peak, leaving him to grope frantically in emptiness!

Vainly he strove to check his toppling. The peak was dropping away swiftly as his feet swung out and down with his approach. His steel-shod feet scraped along the smooth rock of the pinnacle, scraped helplessly where fingers would seize and hold! There came a last little rise, his toes struck and for a moment held, then broke free! His last hope. *It had been enough!*

Toppling past the pivot of his toes, Black Lem Gulliver plunged headlong down the rocky slope of the mountain. At the crest of a minor avalanche of shattered rock he thundered into the valley that split the giant peak, safe! Gulliver's luck—by God, *it had held!*

But it was the wrecked ship that drew Gulliver. There were food and water, and air-tight shelter. There was refuge, and perhaps a long chance at escape. Gulliver knew his ships of space, and if repairs were humanly possible they would be made. As for the figure he had seen prowling about the wreckage—well, why dodge an asteroid until you know where it is? Gulliver slipped extra charges into the magazine of his ray-gun, grinning.

The valley where he had fallen was really a huge crack in the rock of the mountain, running clear through to the base of the cliffs below the plateau. They were smooth-columned walls of black basalt, sheer and impregnable—there was no scaling that height! But Gulliver knew a thing or two. Gravity here was the merest fraction of the pull of Earth—he felt queerly light, even in his suit. And he would fall with the same near-weightlessness, would fairly drift through the airless void that surrounded this pocket-planet. From above—there he could gain the plateau!

In a short hour he stood on the brink of the cliff above the wrecked ship. No need to risk too much—a crevice led almost halfway to the bottom. He crept down it, hung for a moment against the sheer cliff-face, then dropped. Light as he was, the fall jarred him as would a twenty-foot drop in space-armor on Earth or Venus. Those damn cliffs were high!

Nursing some nasty bruises, Gulliver picked himself up and crept toward the wreck, his ray ready to blaze instant death. There were great columns of rock here, split off from the cliff, lying about like pillars of some ancient ruined city. Behind their rocky tangle, deep crevices ran winding back into the cliff. Gulliver remembered the armored form that had vanished from sight, and his advance was the wary prowl of a stalking cat. In any one of those crannies, behind any of these great columns, death might lurk!

The ship lay behind that last jumble of rock, out in the open. Maybe he'd been seen—best to sneak past and attack from the other side. That was strategy, and he was a master of strategy! No big-nose in space was slier than Lem Gulliver! He began his slow advance through the tumbled rocks, watching the near-by ship for signs of life. That was where the danger lay!

The quartz of his helmet glowed cherry-red and the fierce heat of a spent ray scorched his face, filling his nostrils with the stench of burnt hair and skin! Someone had rayed him from the cliff! Gulliver leaped for the shelter of a fallen column, writhed aside with a curse as a second ray flamed from the wreckage, searing the rock just over his head! He was caught between two fires!

THE cliff meant shelter. Gulliver edged his big body among the rocks to the right, away from both ship and crevice, then crept swiftly to the rock-wall and edged along it toward the cleft whence the first ray had come. Once the man in the ship caught a glimpse of his slinking form, and a ray fused the rock where he had just been. He was getting the range! Gulliver did not return his fire. An answering ray might reveal his position to the one in the cleft, and guarantee a warm welcome! Time enough for the ship later. He'd get 'em both, one at a time!

He crouched beside the crevice, pressed flat against the cliff, watching and waiting. The hole wound back among the basalt prisms, and somewhere beyond the first turn death was lurking. Twenty feet—he could make it in one stride! It was the only way—rush him, before he could use his ray, and smash him down by sheer mass of armored body! Lem Gulliver need fear no man in his bull's rush!

Thought and act were one! Like a thunderbolt of steel Gulliver plunged into the dark cleft, ray blazing before him, lighting the rocky walls to incandescence! His giant form caromed off the white-hot wall into the arm of the passage, where a dim figure crouched against the rock, ray-gun ready! A burst of red fury and that gun was fused, dripping metal, and Gulliver was upon his enemy! He was small—a kid, likely, but dangerous. Gulliver's hurtling body caught his slight form full in the chest, crashed him back against the rock wall, crumpled him in a pitiful heap on the floor of the passage! One less!

He was small, a kid, and Gulliver dragged him out into the light instead of burning him where he lay. No man could say that Lem Gulliver murdered kids, unless in fair fight! If the little fool wouldn't listen to reason, he'd give him a gun an' ten minutes' start, an' they'd have it out! Not the first time he'd done that!

The slight body lay crumpled on its face, his right hand badly scorched where the ray-gun had exploded under Lem's fire. He was little, maybe three inches under six feet, and fragile-looking. Damned if he'd have hurt him, if he'd known! No Gulliver ever picked on kids that didn't come to his shoulder! When that bird on the ship was burned out of the way, he'd take the plucky little devil in an' fix up his hand. Funny what he was doin' here—the wrecked ship was a freighter, an' freighters in the asteroid belt used hardened space-men, not kids! By the Lord, maybe *he'd* been the fool! Maybe it was one of those damned little Martians! He had no fool sentiments about Martians! Bad luck or not, he'd killed 'em before an' he'd not stop now for any damn superstition!

Roughly he jerked the body over on its back, peered through the face-plate of its old-style helmet. With an oath he recoiled! By the Lord, *it was a woman he'd burned down—a girl!*

Something queer was happening inside the big outlaw. This was worse than any kid! If she'd been like some of the women he'd known, on Venus or in the Moon, it'd be different, but this—why, she wasn't eighteen, an' little, or maybe she was tall for a woman. An' he'd burned her, an' knocked her down—scared her stiff maybe, if he hadn't killed her. Good God—he a woman-killer! But no—she was breathin' still. In the ship he could bring her to an' fix up her hand. By the Lord, he'd run that damn bird out of there in a Mercutian minute! She was scared of him, hidin' out here—no need to dodge cookin' that egg!

Tucking the girl's still form under his wounded left arm, Gulliver wriggled back through the maze of fallen columns toward the wreckage. Time for more strategy now—clever stuff, to fool the guy in the ship. He must have seen him drop off the cliff, an' been afraid he'd gang up with the girl. Well, he had, but the other guy didn't know it! Ten to one he'd seen 'em fightin' an' figured one of 'em was killed. By the Lord, there was a thought.

He turned to the girl again, fumbled with her controls, flooding her suit with raw oxygen for a moment. That did it! She was movin', her eyes flickerin', openin' —big grey ones, not at all scared. She wriggled out from under his hand, sat up—hoppin' mad at him! Those grey eyes were full of fire—if they were rays he'd be burned for fair! Gulliver chuckled to himself.

No time for monkey-business, though! He sobered instantly, groped for his phone cord, grabbed her roughly by the shoulder and plugged in on her helmet.

"Shut up!" he growled at her flood of words. "I'm not foolin', an' I'm no chicken-livered big-nose fool, either! Black Lem Gulliver's my name—I guess you've heard of me. You tried to burn me an' you missed—well, I'm keepin' you chipper because I'm goin' to need you that way, see? That guy in the ship saw us fightin', an' he won't be at all sore to find you won. Get out there an' show him you did!"

He yanked out the cable to cut off rejoinder and backed up his words with a menacing ray. One scornful glare and she turned and strode boldly out into the open, heading for the ship. Poor kid—she was holdin' her hand kind of stiff—the one he'd burnt. He'd have to fix it up for her. Right now he had pressin' business along another line than doctorin'!

There was no sign from the man in the wrecked ship. Maybe he smelled a rat. The girl was a hundred feet from him and as far from the ship, now, drooping a bit, stumbling as if she were sick. That was the stuff—that would bring him runnin'! Clever kid she was, an' plucky—caught on right off the bat! She was playin' the part like an old-timer! There—somethin' movin' in the wreckage! He was comin', wary, waitin' for her to get nearer. Suppose he waited till she got so close he couldn't use a ray without burnin' her too! She ought to know he wouldn't do that—ought to keep out of the way! Good! She'd done it! Toppled forward just as if she'd passed out—clever kid!

That brought him! He was squeezing out through a hole in the hull, a big Venusian with two guns. Bet he'd gone off his nut when the ship crashed—those Venusians went batty damned easy, an' acted like wild beasts. No wonder the girl was scared stiff! He was comin' forward, still a bit leary, an' bendin' over her. Now!

The Venusian toppled forward over the girl's still body, his steel suit white-hot, twitched feebly, slumped into a still heap. He was out an' out to stay! Damn it, why didn't the fool girl crawl out? That white-hot steel must be damn near cookin' her alive! Gulliver ran forward, foolishly forgetting the Venusian. The damned guy had as many lives as a Martian! His rays flared, biting into Gulliver's bad arm, fanning over his body in a sickening wave of heat. The giant outlaw checked suddenly, stumbled, then his gun spat a fine, thin pencil of red energy that drilled through quartz and steel into the maddened brain beneath! No playin' possum now!

Gulliver's Strategy

THE girl was lyin' just as she fell—somethin' wrong! He heaved the charred body of the Venusian off her still form, turned her over. She was out again—must have really fainted that time she fell! That hand must be pretty bad. He'd have to get her to the ship an' see to it.

It was bad, but not so bad that he couldn't fix it up with the kit he found in the ship. There were still several unbroken compartments—a suite for the two of 'em! Gulliver had been captain of just such a ship in his younger days, and since then he'd had plenty of experience with wounds of all kinds. Few doctors could equal his practical healing, culled from the knowledge of three planets. The girl's hand was scorched and she was pretty badly blistered, but he could fix that up so as not to leave a scar. It wasn't as bad as he'd thought—funny the way women passed out at every little thing! Some of the toughest of 'em couldn't stand blood, for all the killin' they'd done, an' this kid was fragile compared to them. Well, his own arm was no picnic! It'd been rayed twice at close quarters, once by the big-noses on Jupiter an' once by that damned Venusian! From the elbow down it was a dead cinder. Just one thing to do to that!

His ray narrowed to a needle of fierce heat, Gulliver prepared for the operation that was to mark him among men for many months. He dragged in a piece of thick sheathing from one of the wrecked rocket-chambers, laid it over the top of the table, and placed his bared arm on it. With one swift stroke he brought the needle-ray across just below the elbow! For a moment he stiffened with the awful agony as that needle of sheer heat burned through flesh and bone, cauterizing as it cut, then it was done, and his charred, useless arm lay severed on the glowing metal. Short an' sweet, that one! Now he was marked—a one-armed cripple! By the Lord, that couldn't faze Lem Gulliver! Contemptuously he picked up the severed member and tossed it into the corner, then turned away, his swarthy face still white with pain.

Behind him, a wide-eyed girl had gasped in horror as the ray had bit into his flesh, had half-risen to a sitting position, then sank back, sick with pain. Gulliver, turning, saw blood trickling from a bitten lip.

"What's wrong?" he demanded.

"Here—my rib," she gasped. "I think it's broken."

Good God! That furious plunge of his had hurled her against the wall of the tunnel, had cracked her rib! No wonder she fainted out there!

"Where?" he asked brusquely. "Here? Yeah—I feel it—two of 'em. Nowhere else, is there?"

"No."

"Good. Lie still an' I'll strap 'em up. They're not splintered—clean breaks, both of 'em. The radio's still good, an' we'll have help in a day or so. By the Lord, you'll make fine bait for any ship that comes along! Gulliver's luck again!"

She couldn't help herself; she had to obey. Furiously she glared at his grinning face as he rubbed a healing salve into her burns, then swathed her like a mummy in stout canvas until she could barely breathe. She was too angry to talk, and, besides, talking hurt. Helpless, she lay and listened to his rough banter, in a strangely thickened tongue—the speech of the lower levels.

"No use havin' my little fish-bait cracked up," he sneered. "She'll draw plenty of suckers, if I ain't wrong, an' we'll make a nice big haul for breakfast. They'll be fightin' to get at her, damn 'em, Martians, Venusians—half the big-nose scum of space—an' Lem Gulliver is goin' to show 'em how fishin' is done! They'll burn, just like that Venusian! Friend of yours, wasn't he, sister?"

"He was not!" came the gasped reply. "I hated him as I hate you, you swine!"

"Oh, oh! It must be my whiskers she hates! Wait till she sees my handsome mug come out from under 'em—even the big-noses won't know me with 'em gone! Well, sister, you lie there an' watch me shave 'em off, an' maybe you'll like the looks of me better. Meanwhile, suppose we have a little radio to brighten up your disposition an' make you love your Uncle Lem."

He twirled the dials, set them to the frequency range of space-communication, threw in the amplifiers. Messages drifted in—from liners and freighters, from police-ships, from yachts of space—all the usual ether-traffic of the System. There was nothing of interest to him, and he toned it down so as not to wake the girl, sleeping now, with her back turned to him. Funny—all his rough talk didn't scare her a bit, but she was gettin' madder with every word—she'd be ready to skin him alive pretty soon, an' maybe she'd spill the beans an' give him some dope he could put in an SOS. Meanwhile he'd get the generator goin' an' look the ship over.

She was the *Vulcan,* a freighter bound for the police-city beyond Jupiter. The Venusian must have been Alfaraz, the Second Officer—a mean customer if ever there was one! Gulliver knew him by reputation—cruel, heartless, and a fiend with the women. A wonder her folks had let her board the ship.

The log explained her too. She was the daughter of the commanding big-nose officer on duty at *The Titan,* going out to join him for a vacation-tour of outer space. Her papers were all there: Alice Sanford; age, nineteen; race, Tellurian; planet, Earth; description, grey eyes, blond complexion, five feet seven, hundred and twenty pounds, female, unmarried—and so on through all the detailed biography of the usual space-papers. Mother dead—hmm. Father—police official, Henry Sanford, commandant, *The Titan.* Profession, pilot, Trans-Oceanic Air-Lines—so! Bet she'd pestered the captain till he let her take over the ship. Maybe she'd crashed 'em, but it wasn't likely. Jets probably clogged and exploded. Well, there was plenty of dope there for a broadcast. He turned up the speaker again. Wonder what ships will be likely to answer.

City of Laxa . . . Aquila . . . Latrod—some Venusian freighter, probably. . . . Suddenly he freezes in attention as hurried words spout from the speaker, words born a hundred million miles away in the crowded radio-room of a speeding patrol-ship, where bedlam has broken loose!

"Lem Gulliver! Lem Gulliver! Red speaking—Red Tonti! They got me—Giles Wreyburn an' his dwarf—an' we're bound for the Hell-moon, three hours out of Mars. Come an' get me, Lem! I've got 'em locked out of the control-room an' the ship is runnin' neutral! Come—!"

The clang of rending metal, a wild shout, and Red's voice dies. Silence for an instant, then the voice of Giles Wreyburn.

"Wreyburn speaking, Gulliver. I hear you got loose—well, that's a damn sight better than Red Tonti can do! Come and get him, Gulliver. Try out Gulliver's luck! Patrol-ship *Arcturus,* at your service!"

RED TONTI captured! Memories of the old outlaw flooded through Gulliver's mind—of the warrens of New York, where they had met, and of the Moon, where they had fought for leadership of Luna's outlaw hosts, of Venus and Mars, and the freedom of open space. Red always said there was bad luck in killing a Martian, and he'd been right! Lem knew that now—had lost an arm because he'd disregarded that warning. God! If they could only get together, just once, Giles Wreyburn and his whole force would have plenty to do pryin' 'em apart! An' he marooned here on an asteroid, with a sick girl!

He turned and looked at her. She was awake, watching him, something he couldn't get at lurking in her eyes, some hope or veiled triumph. Damn it all, why did he have to have a woman on his hands, an' a sick one at that! He laughed, suddenly.

"So you hate me an' my whiskers?" he said. "You don't like black whiskers! By God, I'll get you red ones! An' you can have a damned big-nose for a nurse-girl! Listen to this!"

His voice changed—softened to the purr of a Venusian, slow and a little stilted. Throwing full power into the transmitter he spoke his message, a grim smile on his bearded lips.

"Patrol-ship *Arcturus!* Patrol-ship *Arcturus!*"

Swiftly came the answer. *"Arcturus.* Giles Wreyburn speaking."

"Alfaraz, second-officer of the freighter *Vulcan,* bound out from Mars. We are marooned on the larger component of a twin asteroid, approximately in your course. All members of the crew have perished. I am left with a passenger, who is suffering from burns and broken ribs—a Miss Alice Sanford. We have two compartments left, and supplies for some time."

"Right!" came the reply. "What is her name, and yours?"

"She is Alice Sanford, daughter of Commandant Henry Sanford of *The Titan.* I am Alfaraz, second-officer of the *Vulcan.* I will care for her, until you come!"

"By God, you'd better! Keep sending until we get your direction!"

Gulliver sounded the high-pitched whine of the oscillator used for directional work, listening grimly to the network of calls sent out through the System, establishing the position of the twin asteroid. Twenty minutes, then Wreyburn's voice came again.

"Alfaraz—are you there?"

"I am here," replied the outlaw.

"Can Miss Sanford speak?"

"With some pain, I think. Shall she try?"

"No—not if it hurts her. I wish I could be sure, though."

"She will speak," said Gulliver slowly. "Here." He turned the transmitter toward her couch, grinning quizzically, challenging her. For a moment she stared, then spoke, faintly.

"I am here. It hurts to speak, but I can say that I am here. Please come soon."

"Our power is going," broke in Gulliver. "The tubes may blow any minute. Are you sure you have us?"

"Sure!" replied Wreyburn curtly. "We'll be there inside of sixty hours. Can you hold out that long?"

"I think so, but you will do well to hurry, for the lady's sake. I think she—"

With a blow of his fist, Gulliver swept the tubes from their rack, breaking off the conversation. In the speaker sounded the frantic voice of Wreyburn, calling into empty, unanswering space.

"Vulcan! Vulcan! Alfaraz!" He stopped, then spoke again in normal tones.

"Patrol ships stand by. We will pick up the survivors of the *Vulcan* and proceed as scheduled. We will need no assistance, but will keep in communication. Stand by for orders."

As the giant patrolman's voice gave way to the ordinary gabble of space, Gulliver turned down the amplifier and turned to the girl.

"Three days' wait, good lookin'," he grinned. "I guess I'll shave, so's you'll take to me better. Then your Uncle Lem will show you some stylish fireworks, an' the nice set of red whiskers he promised you!"

She did not answer. Instead, her pale lips formed a question.

"Why did you say you were Alfaraz?"

"It'll hurry 'em, girlie," grinned Gulliver. "Friend Alfaraz had a reputation that most of the System knows, an' he always did his best to keep it alive. Bein' Venusian, with plenty of pull, they couldn't do more 'an exile him, so I reckon Wreyburn is hustlin' some to get here before Alfaraz gets rough. See?"

"Yes, I do see! Only a beast like you or that Alfaraz would think of such a ruse! I suppose if he knew you were here, he would be afraid to come!"

"Maybe so," admitted Gulliver cheerfully. "But I want him as bad as you do, so I said Alfaraz. You ain't very chummy, an' a little select company won't hurt us any. What I'm countin' on is havin' him be a mite careless, see? He don't know me like you do. Now I'm goin' to shave like I said, an' get us somethin' to eat. Hope you like my cookin' better 'an my whiskers!"

Without his beard, Lemuel Gulliver was not bad to look at. The girl noted that, and he knew she had. Granted the coarsening of a career of dissipation and degeneracy, such as Alfaraz was credited with, he might well pass for a Venusian. His giant stature was his main source of danger, but Alfaraz had been tall, though no giant.

His cooking was better than his face, as he had said. Even outlaws have tender palates, and even freighters have kitchens, particularly with a feminine passenger aboard. He had to feed the girl, which was no balm to her pride and contempt of him, but he was wise enough to spend most of his time out of her sight, rummaging in the wreckage.

On the whole, the three days passed much better than might have been expected under the circumstances. Always there lurked deep down in Gulliver's heart something of the respected space-captain, before the days of the wrecked *Titania,* and now it submerged the coarseness of outlawry to bolster up the opinion his fair patient had formed. He knew better than to shatter the preconceptions of a woman, particularly when she was helpless. He had to bully her into letting him dress her burns again, and all in all he played pretty much the bestial bully, as was expected of him.

The last thing in the System that he wanted was for her to like him! His whole plan depended on his being able to treat her objectively, as a pawn in his game of escape. If he knew her, and if he had played his part well, he had worked her to a point where she would play a lone hand, from sheer pride, and corner him herself. And Gulliver wasn't at all afraid of what she could do alone.

Gulliver's Promise

SIXTY hours became seventy before the *Arcturus* hove in sight above the twin planetoid, traveling slowly, watching for a signal. Gulliver had cleared one of the jets, and dragged it clear of the rest of the wreckage, and now a fountain of scarlet flame marked their prison. Swiftly, expertly, the great ship sank to the plateau. Gulliver needed that expertness to win him free!

Stooped as much as he might, his face partly bandaged, Gulliver limped to meet Giles Wreyburn. Again his voice took on the Venusian purr.

"I am glad to see you, Captain, and I think Miss Sanford will be not sorry. She is there, in the third compartment, sleeping."

"If you have touched her, Alfaraz, by the Law you'll pay!"

"But I have not, Captain Wreyburn. She is very much herself, but for the burns from the exploding jets and her broken ribs. See for yourself." Smiling beneath his bandages, Gulliver limped into the ship. Wreyburn had not recognized him!

Soon two men came back for a stretcher, and the girl was carried to the captain's cabin, where the ship's doctor attended her. His respect for Gulliver increased visibly.

"You did well, Prince Alfaraz," he said.

"Alfaraz, Doctor," purred Gulliver. "My title is not recognized unless the need is great. You know that, surely."

"I've heard of it! Now, may I look at your arm? Miss Sanford says that you burned it."

"What remains of my arm is quite well as it is, Doctor. My Venusian ointments are as potent as your own. Ask Alice Sanford if I can not care for wounds! If you please, I would rest—alone."

Alfaraz remained alone during the days while the *Arcturus* crept clear of the asteroids, but he insisted on aiding the doctor to care for the girl's burns. Consequently, when the deadly swarm had thinned and Jupiter swam near, her burns were fully healed and her ribs knit sufficiently for her to be up and about, watching Gulliver as a cat watches a mouse, waiting for him to move. Cunningly, in his role of Alfaraz, Gulliver played upon her pride, egging her on, fostering her intent to trap him herself, alone.

Then, with the moon of exile looming in the charts, Wreyburn called Gulliver into the control-room.

"You are big, Alfaraz," he said. "Will you help me?"

"What do you want of me?" asked Gulliver, tautening.

"We will drop three prisoners, outlaws, on the moon of exile," Wreyburn explained. "One of them is Red Tonti. He crossed you once, didn't he?"

"By the gods, yes! He robbed me—me, a Prince of Venus—of my ship and my woman! What do you want?"

"Would you like to prepare him for his plunge, Alfaraz? I must be here at the controls, but you should have little trouble in binding him, if you are armed. Will you do it for me?"

"By the gods, I will!"

Wreyburn wondered what would happen when the two met. Which would survive—Red Tonti, by whose hand Rathmon lay cruelly broken in a hospital of Mars, or Alfaraz, foulest scum of Venus, barred by his royal blood from common punishment? While he wondered, that fatal meeting took place.

A ray in his hand, Gulliver strode into the outlaw's cell, slammed the door behind him, and turned to confront the red-bearded giant who was leaping to the attack.

"Red!" He spoke low, in his normal voice. Red's charge broke in amazement.

"Red," he continued, "I've seen the other two, both good men. They're with us. We'll take the ship."

"What's your plan?" rumbled Tonti.

The two guards grinned appreciatively at the tumult within the cell. It was brief in duration, then came a clangor on the door and Alfaraz stepped out.

"He is not dead," he purred, "but he will not waken inopportunely. I can swear to that! Put him with the others." He passed into the control-cabin, smiled as Wreyburn's face fell, ever so little, at sight of him.

"It is done," he said slowly. "It is done well. Do you want to see? They can bring him here."

"No," replied the commander glumly, "I don't want him in here. Where's Miss Sanford?"

"She is below, watching them drop the three outlaws. I told her it would be a scene to remember—three men fighting for life, hurtling through thin air into a fever-ridden jungle, among beasts and men worse than beasts! She will never see it again, Giles Wreyburn."

"Damn you, Alfaraz, that's no place for a woman!" shouted the furious captain. "Hamlin—hold the ship here!"

Throwing the controls to neutral he scrambled down the ladder to the lower deck. The relief stepped to the levers, brought the ship to a standstill, hovering over the jungles of the Hell-moon, ready to drop her load, then turned at the sudden rasp of feet to crash stone-dead to the cabin-floor under the blow of Gulliver's great fist! In an instant the giant outlaw had locked the controls in position, sealed the door into the body of the ship, and followed Wreyburn down the ladder.

Strange was the scene that met his eye! One by one the guards were filing into the dropping chamber, urged by the menacing guns of two of the outlaws. Beyond, Red Tonti was kneeling over the inert form of Giles Wreyburn, binding him with thin steel wires. As Gulliver approached, he straightened up and shoved the huge body of the police-officer through the port, then closed and sealed it.

"What weapons?" asked Gulliver.

"A knife apiece."

"Good. Throw—no, wait!"

Alice Sanford, dressed in a heavy flyer's uniform, had come down the aft ladder.

"What's wrong?" she asked. "The control-cabin is locked up. Where's Giles?"

"Red," growled Gulliver, "open that port! We'll drop 'em with it open, so the lady here can see how Lem Gulliver keeps his word! Here are your red whiskers, like I said, an' there's your big-nose officer, Giles Wreyburn! Look at him!"

Without speaking, she stepped to the open trap and looked down at the unconscious man.

"You're not going to drop them like that?" she cried. "Where are their space-suits, their weapons, their food? They'll be killed!"

"Sure they'll be killed," sneered Gulliver, "but not from lack of air, or a broken neck. We're in the atmosphere, an' they have on automatic parachutes. As for food an' guns, there ain't a dozen rays in that whole Hell down there, an' I'm not givin' 'em to any big-nose skunk! Let 'em fight for life the way *we* have to! We don't get what they have—we fall without parachutes, an' like it, but I ain't takin' chances on not havin' 'em live, an' suffer, down there in that hell-hole of a moon! Look at 'em—watch 'em sprawl like frogs when I yank the lever! Frogs—that's all they are down there, an' if they live it's up to God!"

"So it's up to God?" spoke the girl slowly. "I wonder. Let me tell you this, though—what Giles Wreyburn can stand, I can stand, and where he is, I'll be—not with you and your pack of dirty yellow curs! Remember that, Lem Gulliver!"

With a shout to Red, Gulliver sprang forward—too late. Turning over and over through the thick air fell the form of Alice Sanford, outlined for a moment against the jungle mists, then swallowed up in the black depths of the Hell-Moon!

"God!" whispered Gulliver dazedly. "She meant that, Red. She's gone after him!"

THE END

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What Is Your Science Knowledge?

1. What is the moon-earth distance? (Page 923)
2. How often does the opposition of Mars with the earth occur? (Page 924)
3. What speed is necessary for a projectile to escape from the earth? (Page 925)
4. What speed of escape from the moon is necessary? Has this speed ever been approached by projectiles on earth? (Page 925)
5. In what condition is it possible for a human being to withstand a great acceleration? (Page 942)
6. What is Ganymede? (Page 944)
7. How far is Jupiter from the sun? (Page 947)
8. What is *Mare Serenitatis?* (Page 951)
9. What are the primary functions of a living organism? (Page 966)
10. What is the ultimate basis of all atoms? (Page 982)
11. What universal force binds together all matter? (Page 983)

Martian Guns

(*Continued from page 937*)

come. This girl he had strongly learned to love, he was to lose now. He held Nina's metal-clad hand in his, trying to touch her flesh by the mere strength of his pressure.

Finally he looked through the glass plate into her eyes.

"I must go over to see what's delaying the start," he said nervously. Dropping her hand abruptly, he turned away and strode across the camp toward the *Kingsley*.

But as he neared it, he saw a commotion among the metal-clad figures that surrounded it. For a moment it subsided and then the figures quickly backed away from the ship until it stood alone on a little plateau.

His heart beating in strange excitement, Halliday broke into a leaping run, dashing toward the ship. He had reached the group of retreating figures and pulled at the metal arm of one, speaking quickly into his disc phone.

"What's the matter here?" he asked quickly.

"The *Kingsley's* ready to start," an officer answered.

"Ready?" Halliday started toward the ship, and suddenly a preliminary flash of flame burst from the ship's tail. The officer grabbed Halliday.

"Where are you going?"

"Who's in the ship?" Halliday asked fiercely.

"I don't know," the officer answered. And then came another burst of flame. From the quarters of the *Condor* a group of figures came running. They seemed intent on reaching the *Kingsley* before it ascended for the last time above the moon.

But in the confusion, the *Kingsley* had suddenly risen, it flashed into the air, rising higher and higher; and with the swiftness of thought it sped on and on, its size dwindling as it neared the Martian camp.

Halliday still struggling with the officer, found himself face to face with Cross. Through the glass plates he saw that Cross' face was twisted in anger and surprise.

"He tricked us," Cross shouted to Halliday through the disc phone.

"Who?" Halliday answered.

"Parker," came Cross' reply, pointing far off to the south where the gleam of light that was the *Kingsley* shot its flame into the vacuum of space.

"He told me he had talked it over with you, and you had agreed to let him go," Cross said savagely.

Halliday brought his metal hands toward the glass plate that shielded his face, in a sudden overwhelming emotion.

"Parker, Parker," he cried softly. "You've redeemed yourself now."

Then exclamations from the officers' phones brought their attention back to the shining speck of the *Kingsley*.

"Look!" shouted one, "He's circling."

With glasses now they observed breathlessly as the little ship, alone in the void, circled high above the Martian camp. Then suddenly it seemed to poise motionless and with all rockets flaming furiously it drove headlong down, down toward where the Martian hosts waited.

For a moment, after the ship had disappeared beyond the mountain there was an agonized silence. But then with a convulsion that seemed like the disruption of worlds, the ground beneath them shook and groaned. A tremendous roar seemed to flow like a mighty current along the ground, throwing them violently from their feet. Then came another roar, another and another, until the universe seemed ready to blast into nothingness.

With a violence unknown on earth the ground trembled and vibrated. But gradually the violence decreased, until finally it ceased altogether.

It was a long time before the stunned metal-encased figures could lift themselves from the ground. In the disc phones was heard sobbing and weak calls for help among those unable to rise.

Nina, who had reached Halliday somehow, pointed off to the southwest.

"Look," she cried.

All eyes were turned. Above the mountain range they saw a vast confusion of spots rising swiftly above the moon, rising, ever rising, then to slowly drop down upon the lunar surface.

An understanding of the meaning of this swept over the little group.

"Parker succeeded!" one cried hoarsely into his phone.

"We've won," shouted another.

"The earth is free," they all cried in unison, dancing madly about in their clumsy metal attire.

And so it turned out to be. When a scouting ship was sent out hours afterward, following a long silence when no shells boomed from the gun, the ship found a dead city. As though an upheaval of cosmic proportions had occurred, the Martian camp was one vast hole, in which lay mounds of metal, a desolation of mud, scraps of flesh.

Not a single being in the crater had survived that vast cataclysm.

* * *

In the earthling camp a solemn group assembled in the room of Ferdinand Cross.

"Our devotion to Floyd Parker," he said softly. Heads were bowed for a moment. Halliday grasped Nina's hand tightly.

Then Cross pressed a button on his desk. And with the unison of a single thought, the earth ships rose gracefully from the moon. Wheeling across the dead lunar surface, passing swiftly over the grave of the Martian hopes, they turned into space, where high in the sky lay the globe of earth, promising to its returning children a full measure of love and life.

THE END.

Don't forget to mail in your Science Fiction Movie Petitions!
We will furnish extra forms on request.

THE CRYSTAL EMPIRE

By SIDNEY D. BERLOW

(Illustration by Paul)

Don leaped; the jagged sliver of quartz gripped in his right hand. He drove the weapon into the great red eye.

THE CRYSTAL EMPIRE

SIDNEY D. BERLOW

THE interior of the earth still remains a mystery to us. We have scratched only its outermost surface and remain entirely ignorant of what may possibly be contained within the core.

We do know that great bubbles formed in the core when it cooled, and some of them may have extended passages to the surface, that we call caves. It is quite possible that there exist caves that would lead into the very center of the earth. There, where all the conditions of existence would be quite different from what they are on the earth's surface, many unusual forms of life could have been bred.

Life on the surface is organic, but there is no necessity why non-organic life could not exist and perhaps more efficiently than organic life. But if the two forms of life were to come into collision with each other things would happen. And they do happen in this exciting story.

LIKE an explorer from another world, the great cross-continental flier swept out of the upper atmosphere, poised an instant and shot like a plummet for the earth below.

As the plane dropped toward the city of Attica, New Mexico, the scene began to take on the amazing appearance of a dead black rolling mist. It was not the grayish black of a raincloud, but rather the black of a vast charcoal smear. Coincidentally, an increasingly overpowering odor penetrated the cabin. The puzzled pilot, instead of continuing to a landing, turned the nose of his ship up again and rapidly rose toward the heavens.

Inside the spacious passenger cabin, excitement was rapidly rising to a fever pitch. Some of the passengers crowded around the pilot's cabin, frantically demanding an explanation. A head poked out. "Can't land, folks. Something's wrong down there. It looks as if the whole place's been gassed." A number of passengers crowded forward hysterically. In a moment, panic threatened.

A tall young man detached himself from the mêlée, and swung up the pilot's ladder to face the panic-stricken crowd. "Back—and quiet!" In his hand he held the familiar form of a tear-gas vial.

A man shouted, "My family is down there." Another hurled himself at the young man, but with his arms occupied, the now pale young man made effective use of his free foot. The sharp crack of the tear-gas missile quieted everyone impartially. The ship continued on the rest of the distance to the great Los Angeles airdrome without protest.

The broad wings running finlike along the entire side of the great liner folded and the plane floated down through the canyon in the lofty tower, to sink gently into its deep-dug berth. Steel gangways were quickly dropped and a man in official garb hurried aboard. A hurried conference with the pilot followed. Astounding things developed. It appeared that all communication with Attica had been dead for eight hours. Several craft which had been routed through Attica were missing. A detachment of United States troops was on its way to investigate.

No attempt was made to detain or question any of the passengers. The tall young man had disappeared into the crowd at the first opportunity and anyone following him would have noted that he immediately boarded an express for the nation's capital. Los Angeles, the new center of America's gay life, was all agog. A new thrill was in prospect.

War? "Sure," said the insiders, "the planes that gassed Attica are going after the big cities next. That was just a playful warning." On their lips were glib words, but in their hearts, black fear.

The deadly fog spread rapidly. By the first of August, the entire state of New Mexico was in panic. The government had issued an official warning and hundreds of people were fleeing from their homes daily.

As to the cause of the catastrophe, nothing was really known, although many suggestions were offered. A defense committee appointed by the President undertook to hear the public's suggestions. Divine wrath, various foreign enemies, a group of determined men in the possession of great energy secrets, visitors from another planet—these in turn were suspected.

With the fleeting of another month, the menace had spread over the Texas border and the populous gulf cities were threatened. Worst of all, the explosive attacks that had greeted any troops in the vicinity began to be supplemented by a ray that dried up any object that was exposed to it. A piece of sugar was rapidly charred and bottles of water would explode due to its disintegration into its constituent gases.

Reports came of the sudden lighting up of the horizon at twilight, with an eerie pale yellow glow that seemed to come from nowhere in particular. This particular type of ray was the most deadly of all. It seemed able to combine a good deal of the nitrogen and oxygen of the air into nitric acid with terrific effect on respiration and on water supplies. There was only the doubtful alternative of bombarding the apparent source of the rays with long range artillery as a means of defense.

IN A well-equipped chemical laboratory, a tall young man paced back and forth. Occasionally he would stop before the well-stocked shelves and nervously scribble a note on a scrap of paper. At times with half-seeing eyes he would gaze out the open window at the bright August sun and the green wide-spreading lawns. He was pursuing a runaway idea, an elusive association of thoughts. At a delightful green-clad grove he gazed, but in his reverie, the gently waving branches symbolized only the indecisive interplay of associations in his own mind.

It was this young man, Don Brink, who had averted the panic on the air liner during the first days of the mysterious invasion. More from shyness than from true modesty, he had avoided mentioning his part in the affair. Since that day, he had been racking his brains for the solution of the mystery. Nor was he the only one so engaged, for thousands of the best minds in the country were grappling with the same problem.

But he could not forget that he had been appointed chief chemist of the newly established Attica branch of the Universal Biochem Laboratories and had been on his way to take over the post at the time of the catastrophe. With a certain propriety, therefore, he considered the solution of the mystery his first, if unofficial assignment.

The door swung open suddenly. Turning, he saw his chief, the famous chemist, Luther Ellis, holding a number of sealed vials containing samples of grayish mist.

"Some samples of gas from the New Mexico invasion. War Department wants a thorough analysis immediately."

Late into the day Brink worked at his bench. It was slow, tedious work. Don Brink kept asking himself the nature of the makers of the gas. Were they human or no? From what source did they draw their supplies? How could the building up of such an array of war machines as the invaders undoubtedly possessed have escaped detection on the surface? The underground was left as the only possibility. Well, the ground in the vicinity was honeycombed with caves.

A thought struck Don. He had once read something about a cave in the vicinity. Where? He tried to recollect. Then he remembered. For the next ten minutes he dug feverishly into a pile of old magazines until he unearthed a yellowed, coverless volume. The front page proclaimed it to be the August, 1942 edition of *Wilson's Travel Magazine.*

He read rapidly through a part of the magazine, pondered a moment, and then took out an atlas and studied a map of New Mexico. He noticed that Attica was close to the Carlsbad National Park. He immediately consulted his chief, and on the latter's advice applied to the Defense Committee for an interview. He was granted one for early the next day.

He entered the office of the Defense Committee with a good deal of trepidation the next morning, though he betrayed no outward sign of it. The chairman rose, greeted him cordially, and briefly indicated his associates.

"I should like to bring to your attention an article I have here," the young man began, "in the belief that it may aid in the present emergency." The chairman nodded.

"The following account by the late Jeremiah C. Lane appeared in the August, 1942 edition of *Wilson's Travel Magazine.* The author accompanied Dr. C. F. Clarkson of Clay University in a hunt for cave bacteria and protozoa in the caverns of Carlsbad National Park. The weird events he describes were witnessed by him alone and took place near the bottom of the six hundred-foot shaft at the section known as Cavern 816. To continue in Mr. Lane's words:

"'AFTER inspecting the walls, Dr. Clarkson suspended a small instrument over the pit, took readings of the time required to reach bottom and return, and announced the depth as six hundred and twelve feet. Meanwhile the guide lowered the rope ladder.

"'Descending that black hole, deep enough to bury a good sized skyscraper, I felt like an unguided visitor into the deepest pits of Dante's Inferno. It had beauty, too, for as I examined the walls of the shaft, they broke up the blue-white light of my electric torch into colorful spangles. The sound of running water became apparent and I eventually found myself a few feet above a rapidly flowing underground stream.

"'The sides offered but a clammy and unsecure foothold, but I managed to reach a cavern opening out on the ledge above the river. This done, I took out my pocket instrument and radioed up with instructions as to coming down.

"'It was now that I first took stock of my surroundings. I was at the mouth of a roomy cavern hall. Less than ten feet below me was a river whose rumblings echoed and reechoed continuously. I could now see with my light that the ledge was part of a natural bridge over the underground stream. The room behind me was a very jewel for beauty. It was about a hundred feet wide and high and twice that in length, and adorned by numerous stalactites and stalagmites as well as a number of giant pillars, vertically serrated.

"'It seemed a beautiful crystal chamber, the alabaster walls and pillars were fantastic designs, carved by the hand of nature into the limestone. Irresistibly, in spite of the necessity for waiting close by for the professor, I was drawn into the inviting chamber.

"'There were two passages from this hall, one quite small with a low ceiling, and the other, a larger entrance leading off straight ahead. Feeling sure that I would be able to return promptly, I chose the smaller and more interesting opening. I found the chamber growing smaller for about a dozen yards and then I found myself in another room. With my light I gave it a brief examination and then I turned to go.

"'As I knelt to crawl back through the passage, I felt a solid object distinctly whistle past my face. When I turned my light to investigate this strange occurrence, another piece struck my flashlight with such force as to demolish both lens and bulb and hurl it from my hand. Terrified, I dropped to the ground for shelter. A shower of stones whistled disconcertingly over my head. By now I was in a cold sweat and I could not help but recall the tales of evil spirit-inhabited caves that the old Indians used to tell us about.

"'The cave was suddenly lit up with a sort of greenish phosphorescence. A soft violet gleaming surface appeared with a circular red disc in the center. I had a strange sensation watching this disc. Rapidly it changed color, varying from violet to green to red. I was hypnotized. I could neither tear my eyes away nor move a muscle. The disc of light slowly contracted, changing to a glistening, fiendish black.

"'I could see now the entire evilly shining surface slowly being enveloped in a brown haze. A poignantly familiar odor was in the air. I felt real panic. My thoughts shot back to the World War and the day, over twenty-five years ago when a surprise gas attack caught us unprepared. The choking clouds of chlorine that descended on us; and this—bromine! The haze slowly thickened. The instant that the fascinating eye faded, I jerked my gun and fired, scoring a direct hit. The thing, whatever it was, disappeared with a crash like that of broken glass. The light of the cavern faded slowly, leaving me in darkness.

"'A hasty examination revealed that my radio outfit was smashed. It was hard work shaking off the feeling that I was lost in the darkness nearly a thousand feet below the surface of the earth with the only way out guarded by unearthly enemies.

"'But Providence is notorious for the care it takes of all manner of fools and idiots and somehow I managed to grope my way undisturbed to a point where the distant glimmer of an electric torch soon guided me to where Dr. Clarkson had established himself.'"

The young man stopped reading.

"Well?" Stone, the chairman of the committee, asked icily. He was tired of having his time taken up with fools with some crack-brained idea or "revelation" concerning the mysterious invasion and means to stop it.

"I believe that there is a possibility that the Southwest has been invaded by organisms, if I may so call them, similar to the type that Mr. Lane, the author of the article I quoted, described. It must be remembered that the localities are identical and that it has heretofore been impossible to pin even a suspicion of the blame on any foreign enemy or internal group."

"My dear Mr. Brink, for us to take action on a hypothesis such as yours requires more proof than you show. I would advise you to find more proof before you take our time again." With that he dismissed the youth.

"That just about takes the prize of all the helpful suggestions received to date," Stone remarked amusedly to his associates. "They'll be telling us about ferocious fighting peanuts next."

"Of course there might have been something in Lane's story after all," another said, "but this emergency blamed on it—impossible."

CHAPTER II

Into the Cavern

BRINK refused to relinquish his idea. He thought that if the old explorer's tale had been true and that if his own idea of the cause of the invasion was correct, he must secure specimens of these creatures. But how, where? The area under their control was impenetrable to the best-equipped troops. Could a single man slip in?

In a characteristic burst of energy, Don Brink was attacking the problems furiously and with great detriment to his peace of mind. Time! A little more time! A solution must be forthcoming. Mentally he could see the thriving cities of Wyoming and Colorado threatened by the dominion of the black mist. Southward over the plains of northern Mexico rolled the dreaded smoke blanket, engulfing many and driving thousands before. All this in less than two months. He glanced at the newspaper's headlines, "Colorado Springs Evacuated. Thousands Threatened."

The headline burned his eyes. Explosively, he thrust the paper away from him. The plan had crystallized. He would secrete himself in a Colorado cave at the fringe of the mist, possibly secure the desired specimens, and make his escape by plane.

He made preparations instantly, throwing into a suitcase, a latest model gas suit, a heat ray cylinder, a number of steel cases and other odds and ends.

On the top of the new Oregon building in the nation's capital was the N A L airstation. In a few minutes he had reached the building. A swift elevator carried him to the top. There he caught a Denver-bound special. The company was sending many of their giant planes there. There would be plenty of passengers on the return trips. The terrible mist was now crawling up the mountain on three sides, encompassing the capital of Colorado.

Don Brink passed the overnight trip in anxiety and doubt. Was the venture rash and unsound? Was the old explorer really correct, or was he just exercising his imagination? Sleep was impossible. His nerves were too keyed up. He could only lie awake and let the motor's faintly audible drone react soothingly on his troubled mind.

Eventually, the plane settled down on the landing field, and Brink, alighting, made his way with difficulty through the massed crowds that had congregated at the field. The roads leading from Denver east and north were jammed with citizens and all the belongings they could carry with them. The town itself was a vast bedlam. Transportation was at premium rates. One could even feel traces of the choking odor in the air. The white caps of the distant peaks were black now and the black mist was slowly worming across the valleys like a living thing.

Brink had difficulty in persuading an aviator to take him over to Colorado Springs and to wait for him. The trip was anything but safe. Finally an adventurous flier agreed to pilot him to the Springs.

The plane traveled over the hills until they reached their destination. The air was choking and deadening here. On a ledge on the side of a hill, the pilot landed his passenger and left, to return on a radio signal. Brink donned his gas suit, proof against a mild contamination of the air with the deadly gas. Then, thankful that the plane had been unobserved, he climbed up the side of the hill and after an hour's search he located the cave entrance he sought.

Cautiously he entered. This cave, as the geography chart had informed him, lay westward and southward, toward the area occupied by the invaders; and it had several entrances. Here he planned to wait till they entered. For several hours, nothing happened. Every sound, imagined or real, of the slightest nature caused him to jump. Two long hours passed, three . . . Brink was honestly disgusted with himself. Such a fool idea. But now, as more gas penetrated, he began to feel sleepy.

He leaped up. Time to be getting out. He looked. He looked once more. What was that thing moving in that dark corner? The flashlight beam followed it. Why, it was a chain, a necklace of iridescent azure blue crystals! In an instant it had vanished, snakelike, in a shimmer of color! There were others on the cavern floor. Brink stooped and picked one up incautiously, but dropped it with a sharp cry of pain to survey his yellowed fingers.

HE SWUNG the torch around. The cave floor was literally crowded with odd shapes, all crystalline. They wriggled along the walls and hopped across the floor. Nor were they all like the serpentine shapes that he first saw. Some were larger and bulkier, varicolored, but all were of the peculiar crystalline appearance, like many clear gems set together.

Was this the verification of his theory? Eagerly he scooped up numbers into the steel boxes he carried and locked them. Don beat a hasty retreat to the broad ledge where the helicopter plane waited. Once there he gave the pilot the boxes with instructions to forward them, sealed to the Universal Biochem Laboratories if he should fail to return again.

For he was going back. Not all the pilot's protests and misgivings could alter that determination. There was too much that he had missed and he was going back with extra cases for more specimens. Don gave instructions to the pilot that if he did not return in half an hour to leave and forward the specimens.

Back he went, moving cautiously. He was determined to secure at least one of the larger forms that had so fascinated him. There was little time, for the air was quickly fouling outside.

Securing the larger creatures was relatively easy. They were not as quick as the smaller ones and were easier to capture. With a peal of exultation that echoed idiotically from wall to wall, he turned to leave.

A slight noise sounded behind him. Brink turned —and his jaw dropped. Above him towered a ten-foot symmetrical body, resembling in its gleaming yellow, a gigantic crystal of sulphur. Against the yellow of an upper facet were studded two coal-black discs. From the whole a satanic yellow radiance seemed to emanate. There was a flash of limpid fire behind the coal-black discs and a blue spark shot from an orifice below the discs to the metal facing of Brink's gas helmet. Oblivion was swift and complete.

Brink awoke with the sensation of motion. He lifted his head—crack! He was rubbing his bruised cranium, bolt awake. He was lying in a chamber scarcely larger than his own body. All about him were the walls of cold hard crystal that he had bruised his head against. The pale light that flooded through the translucent walls informed him that his strange prison was moving rapidly through an extensive, lighted area. Where was he traveling to? Was he going to an unknown doom? But utter weariness overcame the speculations and Brink soon lapsed into sleep again. The strange conveyance moved soundlessly on toward its mysterious designation.

* * * * * * * * *

Before a well-covered demonstration table, facing a semi-circular row of seats, stood Dr. Luther Ellis. He had directed the research on the Colorado cave specimens that had been delivered to him. The audience in the seats before him was composed of cabinet members and famous scientists.

"Gentlemen," he began, "I believe the specimens that Mr. Brink obtained at the risk, and I fear, loss of his life, will yield us the information necessary to rid this country of the gray doom that has covered so much fertile land and so many thriving towns in the states of Arizona, Texas, Colorado, New Mexico, and in the territory of the Mexican nation.

"In my judgment, Mr. Brink's theory is correct; the enemy we have to deal with is neither a human one nor a visitor from the skies. Instead it comes from the depths of our earth. The invaders are a race of living, remarkably intelligent beings, but they are not our kind; they are not flesh and blood; rather are they stone and glass—the mineral world endowed with the Creator's spark of life, a race of living crystals."

"I protest," cut in the voice of a prominent biologist. "To me this seems senseless. I request some evidence."

"May I ask you," said Ellis, "to please state some of the primary functions of a living organism?"

"I should name growth, irritability, and the capacity for reproduction, all these without outside aid. Of course," the speaker added, "life is always protoplasmic in nature."

"I on my part maintain that the last statement is a fallacy, based on limited evidence," Ellis retorted, "and I say furthermore that all of these functions and others can be duplicated by mechanisms that we should unhesitatingly class as non-living. Many in the distinguished audience will remember, no doubt, the exhibition of synthetic protozoa that astounded the scientific world recently. The gentlemen may also remember that they were siliceous and not protoplasmic. Silicon is to the mineral world almost what carbon is to the teeming organic world!

"Why even out of cold steel we can make automatons that have almost all the functions of living things."

"Yes," replied the biologist, "everything but reproduction, the *sine qua non*."

"When I have finished, sir," Ellis said, "you will have been convinced, though all the theory in the world gainsay me. I have here crystalline creatures themselves, composed of mineral matter, yet alive in every sense of the word. Their original habitat is probably deep beneath the earth in the vicinity of radioactive deposits.

"TO RETURN to the subject at hand. Before you on the table are some curious, and you will admit, rather beautiful crystals, or more exactly, complexes consisting of a number of varieties of crystals set together. They appear to be excellent ornaments. You see this one of a uniform golden color with a red facet, a crown of threadlike appendages hanging from the top. In form it is reminiscent of the hydra."

He brought his finger near it. Instantly the red facet changed to a deep cloudy violet and the threads lashed vigorously at the finger.

"As you can see," he explained to his astonished audience, "this fellow is immovably glued to the board upon which he rests. In this glass container there are a pair of free living crystals of the same kind that are able to move by the expulsion of puffs of gas over a pair of spiral rollers."

Ellis seized a white rat and thrust it in the container. The rat ran around apparently in great terror. Quick movements of the crystals cornered him. He cowered there, hypnotized. Flailing tentacles shot out, catching him on the sides. Where they struck, the white skin turned first red, and under repeated lashings, black. Then a curious thing happened. The black areas began to melt away and the rat finally turned under the lashings to a shapeless soft mass. Then long tubes suddenly appeared from the sides of the crystals and bending, sucked up the dark fluid.

Ellis then placed a piece of cheese and some portions of cooked starch in the enclosure. The cheese was vigorously attacked and absorbed but no attention was paid to the starch. They evidently preferred proteins.

"And," Dr. Ellis continued sententiously, "there are half a million people caught in the occupied area." There was a strange silence throughout the room and after a pause the lecturer thought fit to proceed.

"Information of such a sort, broadcast to the American people at present, would only double the panic and disorder now prevalent. However, we have been fortunate enough to stumble upon information that may lead to eventual success. We have dissected a number of various kinds of crystal organisms and many curious things have come to light. We have found structures analogous to corresponding animal organs, such as vascular ducts, secreting and digestive cavities, fine networks of copper or silver wires which are nothing more or less than complete nervous systems, surfaces acting as sense organs, and a brain!

"This brain consists of a layer of cream-colored material. The structure of this layer actually is affected by messages traveling over the metallic 'nerves' forming recognizable memory patterns. Your own brain does the same thing for you. If you still doubt me, I offer you the witness of your own eyes."

Ellis turned and signaled to an assistant. The room was darkened and the assistant arranged the apparatus on the table so that the field of the powerful microscope would be thrown by the projection camera on the screen in front.

"Viewed under the microscope as you can now see on the screen, this layer is found to consist of thousands of microscopic rods and spheres arranged in a variety of curious patterns. Physical tests show that the spheres and rods are hollow and filled with some inert gas. They are not all the same. Some contain argon, some nitrogen, some helium or krypton. These gases probably originated in the earth from radioactive decay. The material from which the hollow shells are derived is found to be from certain amino-acids, protein decomposition products. Thus you can see one use that these living crystals have for proteins, animal or vegetable.

"The organism whose sensitive layer you are viewing under the microscope is still alive, some of the glass-like protecting substance having been removed by a bit of surgery. I will now ask my assistant to expose a surface of that same crystal to some hydrochloric acid fumes."

A curious thing happened. Some of the rods and spheres were seen to move in an orderly fashion, forming new patterns and new combinations, some of which dispersed soon after the acid fumes had been removed. A bright light, a changing light, other irritants such as sound waves, alcohol vapor, pressure, caused formations of various different, but characteristic patterns.

"Two important facts stand out. To the best of our rather meager knowledge, the total weight of the brain stuff sharply increases with the increasing complexity of the crystal creature, good evidence!

"Putting these observations together we arrive at a working hypothesis. To have the intelligence to carry out the invasion as it has been carried out, the dominant variety must have 'brains' relatively enormous.

"Simpler forms could obtain sufficient raw material for synthesis into the brainstuff by the occasional trapping of a few bats or other cave mammals, but for the intelligent, rapidly evolving forms, this source is now disproportionately inadequate. The result of that, gentlemen, is what we face today! And the only way to stop them is to cut off their supply of anything protoplasmic."

CHAPTER III

The Prism of Darkness

ELLIS had finished. Beads of sweat stood out on his brow. But the expressions of those before him betrayed skepticism and hostility. One superannuated individual with dry and hesitating voice arose. "Doctor, for giving one an ah—amusing evening, you are as good as a—a circus." And he sat down chirping to himself.

Ellis' head was whirling. He had never expected this. *"If a man doesn't want to believe anything, he will neither see, hear . . . "* His scholarly calm had gone to pieces. "By ——, you don't believe me yet!" With the heel of his long lecture rod he smashed viciously at the large case at one end of the table. The hitherto quiescent creature within bounded out through the cracked glass spattering acrid gobs of liquid all around.

The audience was in an uproar as the weird crystalline creature made for it, spitting venomous streams. Dignified officials dived out of open windows; erstwhile scoffers climbed up the pillars like monkeys up a flagpole, shrieking threats of retaliation. The creature was meanwhile venting its rage on the furniture of the lecture room, till Ellis reaching out with the base of the long bamboo rod, silenced it with a stiff rap on the gaudy crown beneath which its sensitive brain layer reposed.

The audience removed itself voluntarily within half a minute. Ellis sat down and wrote, not a mere note, but an ultimatum to the President's Defense Committee.

* * * * * * * * *

Don Brink awoke with a vague sensation of having traveled a great distance. Slowly he was accustoming his eyes to the semi-darkness. Above him towered his guardian nightmare, the giant sulphur-yellow crystal.

Mustering all his strength, Brink leaped up, tore off his helmet and flung it at the monstrous shape. It met with a satisfying crunch, and Brink dashed along the corridor ahead with the crystal sputtering in pursuit. The pale violet light that flooded the cavern aided Don to dodge stalagmites and columns and slowly he was outdistancing his pursuer.

A thick snakelike bluerape lying on the floor lashed around his legs and he fell to the ground. He could hear (he dared not watch) his captor approaching by a series of angry hops. Don groped in his belt. The heat ray cylinder! Quickly he brought it into play at both bluecoil and yellow pursuer. In a moment the blast had shriveled them to incandescent dust.

A great spotted, but brilliantly colored crystal, reminiscent of the spotted leopard, suddenly rose into view. Instantly, the top flashed red, then half indigo, half green. As if this were a signal, an ominous humming ensued. The light darkened with brownish fumes. Enormous grotesque crystalline apparitions came forward. He decided that this was no place to stay, especially in view of the crystals' demonstrated carnivorous habits. Out he went. Pursuing him came hopping nightmares.

He ran stumbling along to escape the horrors. A long, spear-like tentacle reached his shoulder as he ran, inflicting a deep cut. The blood streamed down his back, and with the fumes, he found himself growing steadily weaker. It was dark now. He suddenly felt the ground drop out from under him. He was falling —falling—he struck the water. The cool shock brought him back to his senses. He swam slowly downstream and soon landed.

DON suddenly realized that somewhere along his flight he had dropped or discarded the precious heat ray cylinder, literally his only means of defense. His former calm was giving way to the madness of desperation. He could see no way out. He had little food and no security. He bound up his shoulder and in the comparative darkness on the shore of the underground river, slept the deep sleep of exhaustion.

A great gleaming eye with a suggestion of cold intelligence greeted him as he awoke. The old hypnotic effect mastered Brink. He could but follow the moving orb and respond to its unspoken commands. Through tunnels and chains of halls, around huge and jagged obstacles, he was drawn by the crystal's gleaming orb. The light slowly increased. At the turn of a corner, they stood at the entrance of a vast, brilliantly lighted iridescent dome, cut by nature's chisel into a crystal palace which might have been drawn from an Arabian Nights' fantasy.

The great hall extended around what seemed to be an artificially cleared space in the center, rows of crystalline creatures of variegated shapes stood. Despite their grotesque appearance, they seemed to blend with the room. There were rows of symmetrical jewels, some consisting of delicate green cords interwoven into basket-like affairs whose parts were in constant harmonious motion; some were segmented creatures and others possessed different forms. But all possessed the same rhythmic motion as if in attitudes of adoration of a mighty presence that pervaded the hall.

In the blaze of fiery light against the farther wall reposed the sight of sights. On a tall pedestal rested a figure like an immense idol, carved of scintillating crystal. But this polychromatic creation was no colossus of dead stone; he was alive, awesomely alive. From the center of the ponderous head a magnificent triangle of six orbs of a color unforgettable, glared into the bewildered eyes of the man. The head was connected to a body, about a dozen feet wide and forty feet high, from which hundreds of undulating limbs and tentacles projected. From its position the regal presence commanded the entire hall with a majesty far greater than Roman Caesar ever essayed.

The great eyes regarded him steadily for a minute. Then the monster raised a glittering tentacle and a beam flashed against a blank space on the wall. On the wall was the image of a huge, obviously artificial chamber. On one wall of the cavern represented Brink recognized a huge relief map of North America, replete with minute detail. The scene shifted rapidly traversing other caverns and huge, half-built crystal cities rapidly growing on the surface under the black mist-curtain. Breeding rooms where seed crystals were growing immersed in fluid in little cells were shown. Vistas of machine shops filled with massive pieces of intricate machinery of a sort not found in the shops of man were flashed before Brink's eyes. He saw great control laboratories where crystal attendants, consisting chiefly of large numbers of flexible fingers, constantly pressed buttons, manipulated dials and attended to all manner of laboratory work. A sight indeed it was for the chemist accustomed to laborious laboratory routine. Another tentacle swung out. The end projected a pale ray. Don Brink's mind reeled and went blank.

When Brink awoke he found himself in a small blind chamber. Across the entrance to this chamber flared a continually flickering but solid sheet of flame.

His mind was tormented by what he had just seen. His brain conjured up pictures of cities ravished by these alien hosts; he could see millions of people literally driven into the sea, or worse, swallowed up in the relentless advance of the cloud-curtained horde. Don ruefully watched the play of the sheet of flame across the entrance and for lack of any other way to express his feelings, hurled a coin at the flickering flame. It struck, melted instantly, and with a hiss flashed into copper vapor.

Presently he walked forward. At the wall, as near to the flame-barred entrance as he could get, he began digging with a sharp sliver of wood. He went through a couple of inches of soft limestone until a metal sheath barred further progress. Taking a steel measuring tape from his pocket, he jammed the end against the metal sheath till it stuck, using the piece of wood.

He then dug away the limestone at the opposite wall until he struck metal again. Then with the other end of the tape on the piece of wood, he thrust it against the metal sheath. The steel became white hot instantly. The short-circuited flame sheet died down to the merest of flickers.

DON leaped through the weakened barrier just as the white hot tape melted and the flame barrier resumed its previous intensity. He was out now and couldn't get back if he wanted to.

Brink could appreciate the irony of his situation. He was free, in a trailless, pitch black labyrinth surrounded by malign powers, a weaponless alien in the capital of the enemy. Even his concentrated food supply would be soon exhausted. Escape from the cave? Don knew too well that no man could live in the deadly black mist outside. He continued to debate with himself his course of action. The decision of this extraordinarily private conference was to hide and to wage a sort of guerrilla warfare.

A day passed. Don had established himself on a little shelf high above an underground stream. Beside him was a pile of limestone blocks. A strange conveyance marked by a faint luminosity could be heard navigating the river below. Off went the pile of rocks. There were sounds like the crunch of breaking glass and a medley of hideous shrieks welled up through the air. A swish of waters and silence once more, grim and oppressive.

Other days and similar raids followed. Don dared not remain too long in one place and he dared not frequent the lighted areas. As a result he had wandered miles through that utter blackness always fighting that grim specter of madness. He knew that if he remained in the darker regions he would be relatively safe, for even these creatures, owl-eyed as they were, needed some light to see by.

He had wandered hours through the unbroken gloom when a faint light ahead caught his eye. The glow floated toward him and he dropped behind a stalagmite. A vehicle manned by a single crystal creature drifted by. Don rose, hesitated a moment with a heavy missile in his hand, then flung it true. The upper part of the brittle crystal creature was cracked off before it could utter a sound. For the first time Don had an opportunity to examine the contents of one of these peculiar egg-shaped conveyances. The longest diameter of the affair was perhaps ten feet, while the shortest was about five. Don approached circumspectly and soon found that the top section formed a cover which easily slid back. Reaching in, his hand closed around a clammy round object and he pulled out—a battered chair. Other domestic odds and ends followed—loot! A small wooden cot, the dusty linen still in place, hung half out of the vehicle. Don brought a lighted match closer. The flicker revealed a broad smear of dried blood across the linen. As Brink stared, the bloodstain seemed to dance with the quivering matchlight.

The match fell from his frozen fingers and the bed ignited instantly. The flare of the burning straw cast eerie shadows on the walls of the tunnel, shadows which the man's fevered imagination pictured as restless, accusing shapes demanding vengeance. With averted face the tormented man fled.

Weary and bruised by the flight and the many obstacles, Don at last found rest. It was not a complete rest but one broken by haunting dreams of bent figures in a murky landscape lamenting without end among the gnarled grey trees. And Don could not shake off the awesome feeling that those creatures in the gloom were mourning his own failure.

When Brink awoke, the darkness had become so hateful to him that he burned match after match of his slender supply in a vain effort to escape it. The thought of turning his back on the darkness and invading the light where his enemies were forced itself on his mind. He interpreted his dreams and visions as commands to face and fight these crystal monstrosities, these despoilers.

But logic forbade. Unarmed, against the invincible might of these creatures he might as well try to sweep back the ocean. He put forth other, extremely logical arguments, but looming against cold reason, a tidal wave against a fortress, was the dull gray vision of the mourners of the shadowland.

The man plodded through the endless gloom, face set, hands clenched, and ever tormented by the visions and the hideous pictures of the world outside that his mind conjured.

Something struck his eye with a shock. He looked again and made out a faint glint of light like a single star dominating a black firmament. The star proved to be a small crack in the flooring. Against the background of that bit of light, Don looked at the darkness with defiance instead of fear. He dug away the limestone around and a narrow oblique channel extended downward. The source of the light was immediately revealed. It was flooding through the translucent substance that formed the bottom of the tunnel. Don slipped down into the tunnel.

CHAPTER IV

The Crystal Empire

IT WAS work cutting a hole in the substance, for it was nearly as hard as the tempered steel of his pocketknife. It proved to be thin, however, and Don, jammed in the little excavation, put his eye to the hole and looked down into a vast, brightly lighted hall.

It was the same great map room that Brink had been shown in the presence of the emperor. In plain view against the wall was the hundred-foot square map of North America. A single giant figure, forty feet high, myriad-fingered, was in constant motion before the map, his long fingers operating buttons, dials and levers. The colors and marked areas on the map were constantly changing.

Don suddenly recalled the vast dark area marking the territory occupied by the invaders that he had seen the first time he saw the map. It was—it wasn't there! Only a small area in New Mexico remained. The marks that represented the human forces were crowded around the remains of the area. Brink pressed closer until an ominous cracking sound warned him of the thinness of the floor on which he rested. His scrutiny showed him nevertheless that encircling hosts of crystal warriors, certainly unknown to the human fighters, lurked in the fastnesses of the Guadalupe Mountains. As the attendant twirled a dial, the area under the troops slowly grew red; red streaks advanced and crisscrossed the section. What else could that mean but that the ground under the troops was being mined?

Don, his exultation gone, watched the slow completion of the preparations for the destruction of the troops. He knew that this creature, probably controlled by the emperor himself, actually maneuvered the crystal forces by his manipulations at the great map. He had just watched them take place under this creature's directions.

Under Don's very eyes, the preparations were finished. The creature waited a few moments, as if for a signal. It evidently came, for the great creature reached a long tentacle-finger down toward the great lever

The lever! A throw and the plan would go through. Everything would be up for the forces representing the major portion of the country's available troops were concentrated in that valley. One man only knew the trap into which they had been led and he was stuck helplessly in a cranny. Helplessly—the word grated. If only he could hold up the execution of the plan long enough to allow troops to penetrate the central cave and destroy the directing influences.

He clutched a jagged fragment of quartz in his hand, braced his cramped body against the walls of the tunnel, and with a well directed blow of his foot smashed through the thin flooring sheet which formed part of the ceiling of the hall below. A dozen feet below bobbed the head of the creature with its single crimson eye. The finger had reached the lever and was starting to coil around it. Don squeezed through and leaped, the jagged sliver of quartz gripped in his right hand. He landed just before the head moved and his right arm drove the weapon viciously into the great red eye. Crimson drops boiled out of the wound and the agonized creature began to flail its long tentacle-fingers in all directions.

Seizing an opportunity, Don dropped to a perch on one of the ropelike fingers. There was a sudden shudder, the violence of which tore Don from his position and sent him careening down the glassy slope, sliding thirty feet to the ground. The curving end of the finger rested on the ground and as he struck the end, the friction of the ground sent him sprawling against the great lever. With a hiss of air the finger whipped up again, narrowly missing him, and sped over the place.

True to instinct, the creature attempted to complete that thing that it had been commanded to do. Blinded it still groped for the lever with its long tentacle fingers. Here and there they flicked.

Over Don's head shadowed the great ten-foot lever. Passing out from the lever slot a cable led to the bank of connections below the map. Don seized the cable and tugged. It wouldn't move. Again that flickering tentacle whistled just over his head. Don clung to the cable lifting off the ground but unable to pull it loose and so disconnect the lever. Down came the tentacle again and struck the man with sickening force. He was hurled fifteen feet and with him came the cable to which he tightly clung. The tentacle found the lever and at last the now disconnected cable was thrown. The man lay still, clutching the cable, his blood slowly reddening the gleaming white marble floor.

THE upper world was the scene of desperate activity. At a stormy session of the Defense Committee, Ellis, now commissioned in the Chemical Warfare Service, outlined his plan and by continuing his use of bravado, intimidated the others into accepting it. The plan called for a great strip of land twenty miles wide and extending in a great arc from Louisiana to Idaho to be burnt bare of every bit of animal and vegetable life. On this artificial plain the forces of the country, armed with the information obtained from the crystal specimens, were to gather in a concerted line of defense.

Along the cleared area, molecular resonance ray generators tuned to the disintegration frequency of the essential brainstuff of the crystals were mounted. Troops protected against rays with lead-sheathed clothing and armed with machine guns and gas projectors were stationed along the arc. All the resources of the country, the best that engineers and scientists could produce, were poured into this desperate attempt to check the tide of the invasion.

Soon it was finished, and on September 22 the first post on the plains of Kansas was struck—and the invader's advance was checked. The next day a half dozen other posts on the great zone had been attacked. The Mist Marauders were momentarily stopped as ray projectors and machine guns sprayed the field. But they did not cease fighting. Like a raging sea tearing at the dikes, they tore at the thin band of blood and steel that hemmed them in. Balked in the attempt to spread by gas and ray, they sent explosive attacks and creatures that clambered over the ground to attack with razor-edged and poisonous tentacles. Scarlet and built like spiders with powerful crystalline limbs projecting from the body, they crawled rapidly close to the ground, over barbed wire, through shell holes and in general made poor targets. In spite of constantly playing searchlights they would often remain undetected and nothing would be suspected till suddenly the men in the trenches would be overwhelmed by a horde of biting, snapping tentacles whose very touch meant eventual death.

The morale of the men exposed was rapidly declining. General R...... wrote back: "Another day like this and there won't be a sane man in my command, even myself." But the troops held on, passing another week in metal clothing under a blazing summer sun and continued to pour an unholy assortment of destruction on the works in front of them. The enemy never showed a sign of effect.

September 28 witnessed by all odds the most violent of all the attacks by the invaders. All through the hectic night the troops were bombarded with incredible ferocity and lurid streamers rained death all along the thousand-mile crescent. The troops were slowly pushed back but each man gritted his teeth and swore not to give up that last few feet of cleared space. The weird storm reached the peak of intensity about three a. m. with bloody hand-to-hand fights with clammy adversaries taking place.

Back and forth the conflicting armies bent. Blasting walls of fire massacred whole companies and the fields gleamed with shattered fragments of crystal bodies. A charge. Ghastly white spears rising out of the earth. Machine guns ripping streams of metal against brittle walls of crystal. White mist, black mist, gas attack, gas counter-attack. Still they fought on both sides. Was this Armageddon?

At several points the crystal forces did break through but they dared not advance unsupported past the resonance ray barriers. Airplanes aided as well as they could but the opposing forces were so entangled that they had to risk hitting friend as well as foe. The men fought as only men fighting for their homes can. Still enemy reinforcements continued. It was an enemy who could neither ask nor give quarter.

As the first rays of the rising sun stole over the eastern outpost of the long crescent, the battle ceased as quickly as it began with the crystal hordes retreating rapidly south and the troops too battered to pursue.

A glorious sunrise heralded the new day and smiled down on the torn flags and exhausted legions below, remnants of the hosts of volunteers of all nations who had gathered there a scant two weeks ago. To the south and west the black mist had split and was breaking up into flocculent puffs and disappearing.

FOR the first time the troops advanced. The main bulk of the enemy had disappeared. The powerful and versatile fighting organization that they had faced seemed to have vanished without trace. Resistance was not entirely dead for treacherous explosions were frequent. Nevertheless the troops steadily advanced in a convergent arc, often savagely razing the beautiful half-built crystal cities they encountered.

Entirely ruined, Attica, the first city to fall before the invaders, was occupied. Still there was no sign of the crystal armies for even from Mexico where they had occupied nearly the whole of the country, the enemy had retreated mysteriously northward.

Under express orders from Washington the caves of the vicinity were searched but little was brought to light. Particularly a cavern known according to the scheme of naming as cavern 816 was emphatically mentioned. Over a short pass in the Guadalupe Mountains and the troops would be at the cave. A picked company of men was sent over the pass.

The men marched over the pass unmolested and soon were being lowered through a sink-hole on the plateau into the cavern. One of the officers about to descend, suddenly clapped the regulation binoculars to his eyes and studied the broken terrain to the west. There lay ambushing crystal hordes waiting the signal to attack. It was only by an accident that the sharp-eyed officer had discovered them at all, for they were visible neither from the air nor from any other point in the surrounding territory.

Word of the discovery was flashed back and the rest of the men descended to carry out their mission of search. Once in the tunnel, they met determined resistance. Flashes lit up the narrow corridor, scattering searing particles and the men were compelled to ray every foot of the path and to blast through the obstructions raised against them. They reached the great shaft after cutting through narrow corridors that the few crystal warriors defended like the Spartans at the pass of Thermopylæ. The bottom of the shaft was rayed and gas-bombed and about half of the men were lowered quickly down the six hundred-foot shaft.

Rifle and grenade in hand they advanced. There was no opposition. From time to time, certain of the men put their ears to the wall or ground and listened for distant or faint sounds.

They moved away from the river. After about half a mile one of the men picked up a faint sound. It was remarkably like a low moan and it seemed to come through the stone wall.

A SQUAD was set hacking at the limestone. When it had been broken through, the entrenching tools thudded against a harder metallic layer. A small explosive charge was promptly detonated against it thereby blowing out a section of the great control map that graced the other side of the metallic layer.

They began to crawl through the gap, amazed at their discovery. The men behind were horrified to see a long snaking tentacle encounter, wrap itself around the first man and swing him aloft and out of sight. The next time a tentacle swung past, a steel-jacketed bullet snapped it short. A man slipped in, hurled a grenade and the forty-foot tangled bulk of the blinded creature came tumbling with a glassy crash.

On the floor before the great map and the banks of keys and levers lay the man whom they had heard. Still half-conscious he was picked up. He muttered: "The Emperor—follow the most brightly lighted corridors—about a mile—big hall."

Some men were left with Brink and the rest set out, following his directions. They threaded their way through the silent corridors of the labyrinth following the brightest corridors. Finally, rifle and grenade in hand the men penetrated the great dome. Against the wall still rested the Titan, his polymorphous court silent and motionless now.

The royal sextet of orbs with their inscrutable secrets held everyone motionless; every man completely overawed. Not a weapon was raised. A faint suggestion of a sardonic expression came over the face, if it might be called that, of the Emperor for the men before him, though armed with the deadliest modern weapons, were helpless before his will.

"Ready, aim, . . . ," a broken voice sounded out behind the line of men followed by a hoarse laugh and a fit of coughing. Behind the rank stood Don Brink in bloodsoaked shirt, pale and supported by two men. The arms of the men went up; a score of grenades were poised waiting the final command as Don recovered his breath. The Emperor faced a firing squad.

The blaze of light against the western wall surrounded the Emperor like the halo of the noonday sun. His color deepened and went up the scale, crimson, yellow, and finally a dazzling blue-white that caused every nook and cranny of the hall to glow. A burning river of molten crystal rolled off the pedestal. The Emperor was gone. He flowed in an avenging molten stream! As the awe-struck men quickly left the hall, the hissing stream flowed round the great pillar that upheld the dome, cutting into it viciously. Overhead distant thunder pealed. The dirgelike rumblings steadily increased in volume. In the distance the drums of the gods were beating the knell of a colossus. The domed ceiling shook and cracked wide. A deep jagged canyon opened. Finally with a truly terrific crash, hundreds of tons of Mother Earth reposing above, broke through, burying the threat of crystal empire forever.

THE END

Is the Discovery of New Solar Planets Coming? Turn to Page 995, for an announcement of great interest.

THE TIME STREAM

By JOHN TAINE

(Illustration by Paul)

Before that swarm of suns had sunk, all upon the island were dead. Without mercy they had been slain.

THE TIME STREAM

What Has Gone Before

A GROUP of science enthusiasts in the year 1906, in San Francisco, try an experiment in throwing themselves back in the stream of time to a previous existence of the human race on another solar system before it come to earth. They find themselves on a desert filled with human bones, and realize that this was the result of a war which had decimated the race. They know that they have been sent back in time to prevent a marriage, which if consummated will wreck the human race. They suddenly return to 1906 and realise that they each have two selves one of which exists in that dim past and the other in the 1906 present.

Several of the men, visiting a young woman friend, a Cheryl Ainsworth, are again thrown back into the past, and they find themselves on a world called Eos, on which the condemned marriage is about to take place. Eos is a world with five suns and five pillars descending on a great ball which supplies the race with atomic energy. Cheryl is one of the inhabitants of Eos, and it is her marriage that the Councillors of Eos are trying to prevent, for if it's consummated, against the Rule of Reason that prevails in Eos, a beast in human nature will be unleashed, and destroy the race. The Councillors know of a tradition that states that ruin to Eos can be averted if they will "Discover the Secret of the Five Suns," and some of the Councillors often slip into the time stream from Eos to a still previous existence of the race, to find the secret.

The Councillors are now ready to hear the evidence for and against Cheryl's being united to her lover Beckford against all the scientific records of their compatibility.

Now Go on With the Story

THEY arose dutifully in obedience to the ancient formula, as handsome and physically well-matched a couple as could be found in all Eos. This part of the ceremony was a mere formality; time had long since robbed it of its value, the physicians and biologists reporting privately their findings to the Council. While standing, Cheryl haughtily scanned the legend on the walls; Beckford sullenly kept his eyes down.

"Be seated," Palgrave ordered quietly. "We see that you are sound. Does any Councillor know of physical reasons, or of conditions of bodily health forbidding the marriage of this man and woman? If so, state the same now, or forever after keep silence."

No Councillor offering any objection, Palgrave put the second formal question.

"Man and woman, do you wish to marry each other?"

"We do," they answered together, without raising their eyes.

Palgrave put the third and last question.

"Does any Councillor know any reason why this man and woman should not marry?"

It was the fatal question, and it fell upon me to answer it. Hating myself, why, I could not tell, unless it were the ungracious thought of spoiling what this physically perfect couple considered their truest happiness, I arose.

"I know a reason," I declared in a firm voice.

"What reason do you know?"

"As revealed by the exact analysis of their ancestors for the preceding three thousand generations in each case, the life records of this man and woman are sheerly incompatible."

THE second instalment of this most unusual story, will explain further the terrible mystery behind the existence of the human race in the world of Eos.

We shall see the working out of the unusual conception of Mr. Taine, that time is a circular stream, that returns upon itself and that it is possible for us to get into the time stream to reach back into the past and come into contact with our previous existence.

This is absolutely not spiritualism, or occultism, it is a scientific conception of the author who is himself a leading scientist, and a professor of mathematics at a large American University besides being the author of a dozen best-selling science fiction novels.

We shall see now the working out of the tremendous drama of a race, before it came to earth; of its attempt to save itself against an almost certain, impending tragedy. And whether it does save itself . . . . But we leave that to the story to tell.

"Does any Councillor confirm this objection?" Palgrave asked when I had resumed my seat.

The first and second chief life and character analysts rose together.

"We do," they said.

"Produce your evidence for the Council to inspect."

They wheeled one of the largest strip-projectors into place, and flashed a summary of Cheryl's ancestral record on the analyzing screen against the wall. Then, immediately beneath it, they projected the similarly magnified spectrum of Beckford's inheritance from his nearest three thousand generations. To the expert eyes of the Councillors one cursory glance at the hideous discord was enough. Palgrave motioned to the chief analysts to withdraw their exhibit.

"It is sufficient," he said. "Those Councillors who give their advisory sanction to the marriage of this man and woman will rise."

Not one Councillor rising, Palgrave continued.

"Those Councillors who withhold their assent to the marriage of this man and woman will rise."

Palgrave rose. To a man we followed his example. He sat down, signifying that the vote had been counted. We also sat.

"It is unanimous," he announced. "Man and woman, stand up."

CHAPTER XII

Freedom or Reason?

BECKFORD leaped angrily to his feet. Cheryl did not rise.

"We overlook your discourtesy, woman, in not rising," Palgrave said without a trace of anger. "We are the servants of science, and you insult not us but that which we serve. Receive now the judgment of the Council: we bar your marriage, woman, to this man."

"We demand our right!" Beckford shouted.

"Take your right." Palgrave's cold words cut like knives. "What is this right you demand?"

"The right of free decision in all matters pertaining to the conduct of our lives," Beckford blustered. "No man or woman of Eos has the authority to direct, check, or in any way influence the free decision and impulses of another without that other's full and intelligent consent. We demand the right to follow the natural inclinations of our characters. We demand the right to marry."

"What talk is this?" Palgrave's tones were bitterly cold and contemptuous. "Who taught you to *demand* what no man or woman may deny you? The Council seeks to deprive none of their immemorial rights. You are free. Our body cannot forbid the union of you and this woman. Our function is purely advisory. We advise against your marriage. That is all."

"Then give us our rights!"

"What rights? Are you madder than we thought? You can pass out of this laboratory and immediately consummate your unreasonable marriage if you still are so minded. No man or woman will interfere with your false happiness. For our first law is reason; our second, freedom absolute and untrammeled. You would transgress our first law, and our second forbids any man or woman to chide you for the insanity of that step. You need demand no right. What you would have is yours by our law. Take it."

Cheryl sprang to her feet, white and breathless with blazing passion.

"Take our right!" she choked. "Take it. Yes, and be held up to the laughter and ignorant scorn of all Eos! That is your freedom—the words, but not their spirit. It is you—you, leader of the Council, and you"—she swept an accusing arm around on the grim Councillors—"who break our law. You have thrown down the ancient law of freedom and trampled it in the mire. And you justify your madness at our expense. We are two against all Eos. Therefore are you brave."

"Sit down, woman," Palgrave said kindly. "This thing cannot be settled by temper. We have the courage to thwart you in what you think is your life's happiness because we must consider a happiness greater even than yours: that of the unborn myriads who shall be the jealous guardians of our civilization when Eos has forgotten our very names. There is a tradition—"

"A tradition!" she flashed scornfully. "What are your cold traditions to the throbbing warmth and passion of a living love like ours? We have the breathing truth; you, the shadow of a dead science."

"Our science may be dead, for all we know. Nevertheless the dead sometimes speak, and our science has not yet lied to us. What would you do with your new truth?"

"Live it, and teach it to all Eos!"

"Before you begin to live and teach your strange new way of love to others, will you listen to us?"

"No!"

"Then so be it. You may go."

SHE turned impetuously to leave the laboratory, and Beckford followed. Then her spirit, inflamed beyond cool endurance by Palgrave's cold dismissal, blazed up again. Turning as if she had been stung, she faced him.

"We may go. Yes; and be taunted by all Eos for a pair of headstrong children. Is this the freedom of our fathers? Which is the more honest, to break one law for the sheer joy that is in love, or to break neither and despise both? . . . What have you to say if we listen?"

"Will you hear it?"

"Yes," Beckford answered sullenly for both. "Better that," he added with a sneer at the impassive faces of the Councillors, "than the mischievous slanders of petty slaves who break one law under cover of another."

CHERYL and her lover resumed their seats, defiant and openly contemptuous of us whom they looked upon as blind, spiritless servants of a tyrannical past.

"You will forgive me," Palgrave began with a faint smile, "if I speak again of our traditions. But it is necessary, I fear. Read, if you will, the deeply cut legend on the obstinate metal of these walls. It tells us to remember the beast. And it warns us not once, but thousands upon uncounted thousands of times, to remember the beast. Does either of you know, or even dream, what that beast is which we must not forget?"

Neither Cheryl nor Beckford deigning to reply, Palgrave continued.

"You apparently do not. Or you would not hasten to this mad union with such unseemly joy. Nor, until very recently, did I myself know the full meaning of that reiterated warning, although I suspected a shadow of its truth. The whole truth which my companions in the living death and I have learned is blacker even than the shadow which I saw."

JOHN TAINE

"What did you see?" Cheryl demanded, her curiosity for the moment overcoming her pride.

"Patience; we propose to show you all that truth in due course. It is a rather long story, but an interesting one, as you, I think, will admit when you have heard it all. Then, if you still choose what you call your love instead of the gentle, proved reason of our fathers, we can do no more. The decision shall rest with you."

"'Rather than admit the thin edge of tyranny,'" Savadan quoted, "'invite swift ruin.' So runs our tradition."

"That is our law," Palgrave resumed. "For, to repeat, and make all clear before we act, I recall that Eos has but two laws: the Law of Reason which commands us to order all our lives in accordance with the proved findings of our beneficial science; and the Law of Freedom, which forbids any man or woman to tamper with the life of another against that other's free will. That these kindly laws may be incompatible, you, the first of our people to dissent from either, have shown us.

"There is a tradition which declares that when we forget the beast we shall overthrow the law of reason and broadcast the seeds of universal ruin for all Eos. So ancient are our records that no man living can discern from the records alone what is the truth behind their shadowy symbols. To discover that truth the Council decided to question the dead past of our remotest ancestry. This had never before been attempted in our recorded history; for the difficulties in the way are as great as the dangers.

"Nevertheless we have at last succeeded, after numerous brave but fruitless trials by our Councillors Savadan and Sylvester. We have explored to their darkest recesses the beginnings of our history and the origins of our happy life in Eos. We ascended the stream of ages and found on its distant waters the shadow of what our race once was. And in contemplating the vivid reflections on those moving waters of our past, we saw the truth of all our legends take solid shape and live before our vision. The truth revealed forbids your marriage."

He paused for a moment, and then turned to the one of us who had been sent the farthest back.

"Dill," he said, "you having ascended the stream of ages farther than any of us, may properly give your testimony first. Be brief, but spare nothing that is essential to the enlightenment of this man and woman from a sense of shame at our forgotten brutehood."

Dill, looking strangely fresh and young for his age, rose and addressed the Council. While speaking he steadily regarded Beckford. Cheryl he never so much as glanced at. Between the two men there appeared to be a new and unaccountable bond of sympathetic understanding. Dill seemed to be deliberately trying to seduce Beckford to a forgotten way of thinking. It was unexpected and singularly disturbing.

Palgrave and Culman evidently had the same impression, for more than once they exchanged a troubled glance.

"Ascending the time stream," Dill began with pompous self-importance, "I reached the beginning of our civilization which is recorded in our legends. As Herron and the other will relate, the place from which our race sprang is so distant from Eos in time that æons ago its last vestiges perished. It has ceased to exist. Is not that true, Savadan?"

"True to the letter," Savadan answered. "So inconceivably remote in time is the place where our ancestors laid the first foundations of our life and customs that its very atoms have long since disintegrated and passed into everlasting nothingness. Not a trace of it remains save its moving, indestructible reflection on those waters of eternity which we call the time stream."

"AND was this the place where Eos now is?" Cheryl asked curiously.

"It was not," Sylvester said. "It lay in a region of space far beyond the dimmest stars which our astronomers can detect with the utmost refinements of their penetrating skill."

"How do you know all this?" Beckford demanded with a scornful incredulity which he made no attempt to conceal.

"That," Culman answered him with some severity, "is part of my testimony. At this time you will do well to follow Dill's evidence. He saw and lived with the beast which you would provoke into life again. Disbelief of unheard evidence is no sign of an open mind. Listen."

"Dill," Palgrave ordered, "continue with your witness. Only such comments by members of the Council are in order as will clarify the testimony for this man and woman. Give only the essential details of what you saw. Spare us the recital of wrongs which might unduly move us, but be clear."

"I must state first," Dill resumed, "that the inhabitants of that place were in some ways giants in scientific intelligence. Compared to them in these respects we are but pygmies. In particular I refer to the perfection of medical skill. The bearing of this is of so great importance for the clear understanding of all the stirring drama in which I was a humble actor, that I must ask you to keep it constantly before your minds while I deliver my testimony."

"Do you imply that you actually lived with these disintegrated ancestors of ours?" Beckford sneered.

Dill rubbed the back of his hand over his eyes, and for a moment seemed dazed.

"Incredible as it may sound, I did. I entered, or seemed to enter, into the body and mind of one of those extinct beings. And that body and mind were my own. Or thus it seemed, so vivid was my experience in that past life. But, to return. The medical knowledge of that race had developed out of all proportion to their other scientific attainments. True, they had an extensive practical acquaintance with the major phenomena of heat, light and electricity and their uses in maintaining life and lessening labor; but they lacked the one essential discovery which links all these sciences together and makes life possible as we know it in Eos. In brief, their scientific acquirements, in all directions save one, were primitive and barbarous when judged by our own standards.

"The one exception was in their care and preservation of bodily health. To them disease would have been simply incomprehensible."

"Then were they immortal?" Cheryl asked, interested in spite of herself.

"In the strict meaning of the word, no," he answered without looking at her. "Yet they were immune to all disease in the ordinary sense. We ourselves have conquered all but a few of the minute forms of life which prey upon us and multiply at the expense of our lives; they had vanquished absolutely all. Life-destroying bacteria were extinct upon that vast planet where our race lived out its early morning.

"Moreover, organic defects of the body were rare to the point of nonexistence. A highly perfected surgery and expert body-manipulation had eliminated the last and most fatal of them."

"Then how did these mortals ever die?" Beckford asked.

A glazed, lethargic look crept over Dill's eyes when he answered. His speech was slow and thick.

"By the mechanical destruction of their bodies," he said.

Cheryl recoiled in horror. It was an idea which revolted every instinct of a normal Eosian, man or woman; for in Eos no being has ever met death by violence.

"The circumstances of their extinction," he continued, "are the cornerstone of my evidence. First, however, let me say that I drifted back so easily into that dead life that all memory of Eos faded like a dream. I was one of those people. I was born on that forgotten planet; I grew to manhood among its inhabitants, and I became a leader in their central assembly. Yet, for all its hard reality, my life in that dead place seemed always a reminiscence, a thing which had been, which I was in, yet which I was viewing from the outside. In short, I seemed to act and to watch myself acting; to walk before the mirror and to be the image behind it.

"One detail of my environment there always troubled me. There should be, I thought, but five suns in the sky of that planet, vast beyond all measure though it was. Yet there were not five suns, but uncounted millions of them, all packed together into one huge, dense spiral that shone over a full quarter of the heavens as a single sun. This rose and set; again a strangely unfamiliar vision to my dulled, forgetful eyes.

"Again, the enormous size of the planet on which I was living was to me the constant source of a numb wonder which I could not analyze. A million spheres the size of our Eos might have been scattered at random over the vast Central Desert of that planet, and they would have lain there as inconspicuous as a handful of pebbles.

CHAPTER XIII

The Struggle for Survival

"I HAVE just alluded to what we called the Central Desert. In that life we also had our recorded history and our gray traditions. One detail only of these need I relate, for it was constantly being verified during my long, unaging manhood in that place. The Central Desert, according to legendary history, had once been a fruitful and populous region, traversed by many great rivers, and green with the abundance of inexhaustible fields. Gradually, the traditions ran, the soil had become barren beyond hope of restoration, worn out by innumerable harvests, and the desert had begun. The rivers sought new channels, or, wandering undirected over the thirsty sands, disappeared completely in an ever lessening volume of water.

"The Desert spread like a disease, slowly eating up the face of the planet. And the prophecy was that the ravages would cease only when they had laid waste the whole surface of the planet. It was dying by finger-breadths, almost imperceptibly, but none the less was it bound for a death universal and supreme."

"That brands your testimony as a childish fabrication," Beckford interrupted. "Who ever heard of a race being overmastered by hunger? For that, I take it, is how the inhabitants in that place ultimately perished—at least in your account of them?"

"It was not," Dill replied heavily. Again the dulled, lethal film stole over his eyes. "How could they perish of hunger? Easily, had they but had the courage to face the desert as it advanced upon them. But they turned their backs and fled before it." He moistened his lips. "They fled, and the creeping Desert pursued, always a generation's march behind them."

"Then it never overtook them," Beckford exclaimed triumphantly. "For a generation there, according to your own testimony, was just as long as they chose to make it. I've trapped you in your own snare!"

"No. I spoke, for a particular reason which you shall see presently, in terms of our own generations here in Eos."

"I admit that I quibbled," Beckford acknowledged. "Still I do not understand. There is a serious flaw in your testimony. Why did not they drive back the desert?"

"Because their science was medical lore. Because medical knowledge was all their science that was advanced beyond what to us is primitive barbarism. Because their surgery allowed no man to die, no child to escape vigorous, hungry manhood or womanhood."

"Do you mean to assert seriously that the race was at the mercy of the bare soil for its food and drink? Why did not they restore the desert to fertility, as we should have done in their case?"

"Because it was exhausted, dead, barren forever. Because they depended upon huge, cumbersome machines and slow human hands for their labor. Because, in a word, they did not know how to extract living, creative energy from dead matter."

"Impossible! A child can learn how to unlock the all but infinite power and energy stored up in every pebble. And these people, you say, were intelligent. If so, why didn't they tap the fountains of life and drive back the desert? They could have made it fruitful again in half a generation."

"A child knows the secret of nature's inextinguishable life, you say. Their children did not. They died, but not of hunger." He paused, and rubbed the back of his fat hand over his eyes. "The commonplace of Eos was unknown to that people. In their assembly halls was no Chamber of Undying Fire. For they were not as we; nature was master, they the servants."

"I don't believe it!" Beckford shouted, leaping to his feet. "The process is part of our minds as thinking beings. A rational mind without that instinctive knowledge of the simplest change in all nature which is necessary for the preservation of our species, is inconceivable! This is but another of your lies to deprive us of our right."

"Sit down," Palgrave ordered. "Could you, Beckford, rediscover the secret, were it lost? Or, knowing the process, as every Eosian must, could you by yourself, without the scientific aid of trained engineers, reconstruct it for yourself?"

"Yes!"

"May you never be called upon to make good your boast. Go on, Dill."

"It was during my life in that place that the encroachment of the desert reached its crisis. Although still regulated—as it always had been since the beginning of the desert—by the Central Assembly, the increase of population continued at its normal rate. And none died. The desert advanced as steadily as it had always crept on, and none knew how to halt its progress. That was the one disease for which they found no cure.

"THERE came a time when for long—perhaps a thousand of our Eosian generations—the supply of food seemed to remain stationary. Each inhabitant had enough for the sustenance of his body, and no more. Then it was reported that the desert was advancing. It was decreed that no more children should be born. From that time on no new life saw the hard light of those clustering suns above the creeping desert. The supply for a very short time after the decree seemed to stand still. We dared to hope.

"Then those men and women in the most vigorous prime of their maturity began to feel the strange, unaccustomed pangs of hunger. The food was rationed by command of the Assembly, but the hunger spread. It attacked next the young. For the desert, having grown like a fungus from a spot the size of Eos to half the area of the planet, was sweeping on at an ever greater speed, like a fierce fire fanned by the wind over a plain of dry grass. A red blight attacked the fields nearest the rim of the onrushing desert, killing the harvests.

"Within the hundredth part of one of our Eosian generations the hunger became unendurable. Yet none died. The men and women shrunk to shadows, too enfeebled to work the unwieldy machines with their crude electricity which tilled their stubborn soil and gathered their ever diminishing harvests. And the younger withered like cut flowers.

"The Assembly went into secret session. In that great central council men and women were equally represented. Thus was justice secured to all. In my turn I was called upon to suggest a means of saving our race from slow starvation. My plan was rejected. We rose without having reached a decision.

"Again the Assembly was called together. And we noted that to a man and woman the scientists had deserted us. They numbered in all about eight hundred men and six hundred women. These, whose sworn duty it was to discover and uphold the truth, deserted us in our greatest need. We cursed the name of science.

"I shall testify why the men and women of science quitted that infamous Assembly," Savadan coldly interrupted, "when I give my evidence."

"If time lacks for you to give all your testimony," Herron said, "I will corroborate what you have in mind from my reading of the monuments. For those fourteen hundred men and women of science left a record of their desertion, as well as of many other things. Go on, Dill. Were you the author of the plan which the Assembly adopted? Did they finally accept your suggestion?"

"No," he answered thickly. "It was another who proposed the remedy."

But we who had seen the Desert of the Dawn knew that he lied.

"The Assembly," he resumed, "was not like our Council. We have merely an advisory function. The Assembly had absolute authority over the lives of all the inhabitants of that planet of the innumerable suns. So when the Assembly learned the treason of the scientists, it ordered that they be taken and their bodies destroyed. The order was futile. Our quarry had fled beyond reach of our justice. Before we could capture the traitors they had entrenched themselves, with much of their apparatus and all of their destructive machines which only they could operate safely, in the deepest caves of the mountains, sealing the entrances after them.

"We dared not pursue farther. Within their vast caves they were beyond justice. For they sent us word that their refuges were fortified impregnably with all of their fiendish devices, and that they would protect their bodies to the extreme limits of violence. We, who in the simplicity of our hearts were unprepared for war, had no means of coming near them. We abandoned the pursuit, deciding to save the race without their aid, and trusting that they might perish of hunger. For before long the food within reach of their caves would be exhausted and further forays meant war upon us. We at once set about preparing ourselves against the chance of their hostile egression. But these preparations were superfluous, as I shall relate."

"And how did your courageous Assembly preserve their starving race?" Palgrave asked with biting irony. "By creating the Desert of the Dawn?"

"What was to be done? The people were starving. They had been driven by the desert onto the last green island of fertility. There, like flies over the scanty food, they swarmed together in a huddling mass, almost treading out the last harvests in the madness of their hunger.

"WE DECIDED. Not all could live. And it was a merciful decision. For it was better to meet death by the painless destruction of the body than by its lingering extinction through weakness.

"Who should be called upon to offer themselves to preserve their race? A secret vote was taken. The honor fell upon the young. For these, not yet having tasted to the full the sweet joy of life, would part with it the less regretfully."

"You condemned the ungrown young men and women?" Cheryl asked. Her voice trembled with utter scorn and fierce anger.

"I did not. The Assembly decreed it. They were all mature men and women, wise in judgment. The decree went forth. Then the beast that had been sleeping in the hearts of the people awoke. None would willingly offer himself or his son or his daughter as a sacrifice for the well-being of his race. Those who should have died gladly for their fathers seized sticks and stones. But so enfeebled were they by hunger that their blows for the most part fell harmlessly.

"Then strife unrestrained burst upon us. Each demanded with blows and curses that his neighbor die to save him. Sons rose against their fathers, daughters against their mothers, crying that they, the young, should not be destroyed, but rather the old who had tasted the good of life. Our race became beasts given over to war.

"Heavy of heart, the Assembly adopted a modification of a plan which it had once rejected. It was impossible now, without the aid of the treacherous scientists, to carry out the original plan. For some kinds of knowledge the Assembly lacked—although they all were mature men and women of sound judgment, and skilled in government."

"Was the modified plan yours?" Culman asked in a voice which stung like a whip.

"No, it was another's."

Again we knew that he lied. He moistened his thick lips, and resumed his bitter history. Hitherto he had spoken haltingly, as if ashamed. Now a note of exultation stole into his voice, and when he finished he was shouting.

"We put the plan into execution. It was simple. For long the people had made use of electric brush discharges above their fields to stimulate the growth of their crops. These discharges were feeble, since too much electricity in the air would have killed the grains. This work had always been carried out under the direction of the scientists; the growers themselves understood nothing of the simple physics underlying the practical process. To them a high tension discharge would have seemed as beneficial as a low.

"Saying that we had discovered a new system of crop stimulation, we ordered high towers erected about the last island of green harvests—a little plot of life no bigger than our Eos in an illimitable wilderness of barren, drifting sands where nothing might live.

"The enfeebled people toiled long to equip those towers. For a time it seemed that their strength would not suffice to complete the gigantic task, and the Assembly despaired. But with the repeated promise that those towers when finished would make the food supply sufficient for all, we filled their hearts with the hope of despair, and sent the last strong tide of life throbbing through their veins. Our promise was the truth: had all gone as we planned, none need have perished of hunger. For there would have been abundance for all living.

"At last the towers stood complete, a girdle of strength to preserve the life of our race. The last equipment was installed, and the exhausted workers cast themselves upon the ground to sleep. The Assembly ordered that they be given a double ration of food upon their awakening, and manned the towers.

"The Assembly—without its traitor scientists—numbered some twenty thousand all told—men and women of mature judgment who could be trusted with the operation of the towers. There were approximately twenty thousand towers in the girdle. To each tower one member of the Assembly was assigned as operator. My own tower stood on the highest mountain, far above the others. Although it was a long journey from one tower to the next, we had manned them all between one rising of our suns and their setting, so perfect was our machinery of transportation; and we sat through the darkness in our towers waiting for the dawn.

"The swarm of suns rose in their vast spiral over the green island girdled by the towers. It was the last dawn. For so the Assembly had decreed, but not for all. We sat motionless in our towers, I in the highest of all, waiting until the swarming ball of fire had toiled up the long, steep arch of the heavens.

"At last the great flame paused for an instant directly overhead, before beginning the slow descent to darkness. There it blazed, a broad face white with wrath, flaming its hot anger down on our last greenery. It was the instant decreed. We—"

"Stop!" Palgrave thundered. "Keep your foul secret. Some knowledge is best dead, and this is such. Tell us the end, and sit down."

CHAPTER XIV

The Story of the Monuments

DILL shot him a swift glance of unutterable evil. "I shall remember this," he said, "when Eos has need of my counsel. You ask the end. You already know it; for you have seen the Desert of the Dawn which once was that last island of greenery. Before that swarm of suns had sunk, all upon the island were dead. Without mercy they had been gently slain."

"And the Assembly," Culman asked in deadly calm. "Did they really earn the reward of their unselfish labor?"

"No," Dill responded in a saddened voice. "Those great spirits had underestimated their strength. They too perished."

"Beasts," said Cheryl. "There was justice even in that dark place. Think of the wisdom of the Assembly. Then think of the young, and say if in all that travesty of humanity there was not at the end some justice."

"Did not one escape?" Beckford asked incredulously.

"One," Dill replied, lowering his eyes. "The accident that my tower was higher than the others lifted me above what fell like an icy clutch upon all the rest."

"And did you, like a worn-out worker, enjoy a double ration of food when darkness came?" Herron asked.

"I dared not descend at once," he replied, "for the dew being heavy yet lingered in the valleys."

"But when the suns had risen again and dispelled the dew?"

"I descended."

"And ate?"

"Yes."

"Did you choke?"

"No."

"That is all I wished to learn," Herron said. "I was verifying a statement on one of the monuments; that was all. It declared that our ancestors in the Dark Place ordered their lives according to some mystery which I could not understand. I think I get the meaning of that inscription now. But it doesn't matter for Eos, whose only laws are those of reason and freedom."

"How did you die?" Culman asked.

"The scientists unsealed their caves when the suns rose for the third time, and came forth for food. They found me—"

"And became like beasts?"

"They struck no blow. I was led to the rim of the desert and commanded to walk toward the place of the sunset. The great spiral was just starting on its downward path in the heavens when I set out across the desert. Darkness came, and with it thirst. The suns rose again, but I saw no greenery. I was lost. After that I remember little, except that somehow, somewhere, I entered the stream of ages, and awoke in the Chamber of the Undying Fire."

Dill sat down and once more a hush fell upon the assembled Councillors. It was broken by the low sound of Cheryl's voice.

"Prove to me," she said, "that my marriage will cause the death of one child in Eos, and I will forever renounce my love."

"In due course," Palgrave replied, "we shall prove more than you ask. Savadan, Sylvester, and Herron, give your evidence."

Savadan rose and faced the Council.

"Our joint testimony being summed up in Herron's reading of the monuments," he began, "may well be given by him. It will be sufficient for my part if I condense my own experience into a short statement, at the same time correcting some unimportant errors in my previous reports to the Council.

"As you know, Sylvester and I repeatedly attempted to reach the monuments which are mentioned in our legends, and which our ancestors erected in the Dark Place—the vast planet of Dill's experience in the beast-state—before leaving it forever. We sought to rediscover the imperishable images of those monuments by ascending the time stream. All our attempts were baffled; and more than once we lost each other in mid stream, to meet again in strange places and in stranger times.

"Once I feared that I had lost Sylvester forever. But happily, as I shall relate, I found him by accident in a shadow life beyond Eos. He was so changed, and I too, that we saw each other frequently in that life without a gleam of recognition, until chance unsealed our eyes, and we remembered. Possibly the process which Ducasse used to send us back into the past was defective; or perhaps we ourselves were too inexperienced in the ascent of time to reach our destination.

"For it is a fact, and in this Ducasse has confirmed me, that he too lived with us in the shadow life to which I referred, showing that he himself slipped into the stream against his conscious will.

"WHATEVER the true explanation of these irregularities, they but emphasized our failure to reach the monuments, not once, but hundreds of times. We failed, but not completely. In our legends you will recall many obscure hints whose meanings we have never fully understood. Remembering these in the midst of the time stream, Sylvester and I recognized them as guide posts, deliberately planted by our ancestors, to direct us safely back to their epoch in the history of our race.

"These half-familiar time-marks, shining with ever greater clarity through the mists of antiquity as we receded in the stream, enabled us to get our bearings and to understand more clearly our surroundings. Starting from them, we sought again and again to reach the monuments which were our destination.

"In the great majority of trials, however, we either shot far ahead of our mark in time, or ages behind it. Indeed, as I have intimated, I am convinced that on several occasions both of us drifted into the unknown future which lies ages beyond our life here in Eos, and we, like Dill in his remote past, lived out equally full lives, at least in part, in an equally distant future. It is of this shadow life that I wish principally to speak to the Council, and to you, man and woman.

"In that future life all memories of Eos save one, so far as I can now recall, have perished. And the one is so dim and blurred that only with difficulty can it be recognized, even by an Eosian, as a reminiscence of our happy life in this place. To others who have never experienced the joy of living and thinking here, this shadowy legend must appear improbable and childish indeed.

"The legend of the future to which I refer is called by our remote descendants 'The Story of the Golden Age.' It describes, but very faintly and imperfectly, some of the minor happinesses of our own flawless life here in Eos. To my mind there is little doubt that this legend is all that the future will remember of Eos, of us, and of our supreme happiness. For in that dim place the people set great store by gold, which to us is but a base metal. To them it is the source of all good and the symbol of their minds' contentment. So to call an age of human history golden is, therefore, for those people, to praise it beyond all measure.

"And though the thin shadow of our happiness which survives in their legend of the Golden Age is dim and disappointing indeed, yet it is infinitely more desirable than the gross substance of any joy which their own life has to offer. As I recall that unborn people, they are half of them wretched all their lives; and their happiness would be to us an intolerable burden, not to be carried by any man. Were we as they, we should seek the lasting solace of unending sleep. And we should lie down to slumber without one regret for the life we were quitting forever.

"It is for you, woman," he continued, addressing Cheryl directly, "to make that wretched future which we have seen dimly as through thick glass, nothing more than the waking reflection of a baseless dream. It is for you to perpetuate the true Golden Age—our present life in Eos—of which those starved wretches remember nothing. It is you who will decide whether all that we cherish shall become a dream that none remember, or whether it shall be preserved for our descendants whole and unsullied, a joy forever.

"It is for you, man," he said, wheeling sharply on Beckford, "to say whether or no Eos is to return to the beast state of the legends. You have seen that state with your own eyes; it lived again before you here in Dill's testimony. Yes; and I seem to remember that you have looked on it yourself elsewhere, if not in the flesh, then in the shadow. It is for you to decide. Eos is in your hands. I too have seen the dim reflection of such a state, and it is not in our past. No, it lies in the future toward which Eos at this moment is rushing on the ever moving waters of eternity. What will you send down the stream for our children to inherit: our happiness as it is, or the hunger, the wretchedness, the darkness of mind, the selfish hatred, the blows and the killing that made our past a hideous nightmare to be forgotten?

"You do not speak. Well, your act when you have heard all our testimony will be a truer answer than any words now.

"Palgrave, I have but little more to say before calling upon Herron. As you know, it was in that future life reflected on the time stream that I saw the shadow of the truth which enabled us successfully to ascend the stream and reach the monuments. For in that shadow of a life I met the dimmed reflections of yourself, Herron, Dill and the others who have at last ascended the stream and deciphered our legends. And," he said, suddenly facing Beckford, "I saw your shadow there too. You were not one of us, but an onlooker and, as now, a disbeliever."

BECKFORD flushed and stirred uneasily in his seat, but said nothing. Palgrave leaned forward, scanning Cheryl's face with a searching, eager gaze.

"Do you remember nothing?" he asked. "For now I recall that you also were in that shadow life with me."

She shook her head. "I have dreams that I cannot understand," she answered doubtfully. "But you, leader of the Council, never come to meet me in sleep."

Palgrave sat back. A shade of disappointment flitted over his eyes, and he said quietly to Cheryl:

"This love has made you blind."

For a moment he regarded her speculatively; then, turning to Sylvester, asked:

"Did we meet this woman in the shadow life beyond Eos?"

"Yes," Sylvester replied. "We all saw her shadow—except perhaps Savadan and Dill. But the memory is dim. She was not one of us."

Palgrave sighed. "I wish I knew," he said to himself. His eyes darkened, and absent-mindedly he fixed them on Cheryl. I think he did not see her; his vision was wholly introspective. For her those wide, dark eyes seemed to have a curious fascination. She bent forward, staring into their depths.

"Leader of the Council," she said in a low voice, so that only those of us nearest Palgrave heard her, "why do you persecute my lover and me? You too know what love is."

With a violent start Palgrave came to himself. He had heard Cheryl's question, and his face grew stern for an instant. Then it softened, and a look of great weariness stole over his eyes.

"I was dreaming," he said in a voice as low as hers. "For a moment I thought that here I am tired of things, why, I cannot tell. I ask your pardon, Councillors," he continued, raising his voice. "These lapses into forgetfulness, as Ducasse will tell you, are frequent after immersion in the time stream."

"Perhaps you had better lie down and rest a little," Ducasse suggested.

"No, I'm all right. It was a mere drowsiness, signifying nothing. Savadan, continue, if you will. How did you lead us out of that false life?"

"For long I tried in vain to turn your minds back toward Eos and what was then, in the future life, our forgotten existence as more than thin shadows. At last the accident of a peculiar sound, singularly like that which we in Eos associate with the faint clicking of the great central ball of Undying Fire, gave me the clue which I lacked; and together we quitted that unreal life, not however, without relapses into unreality, and began our sure and swift ascent to the legendary origins of our civilization.

"There is one impression brought back by the first of us to return," he nodded in my direction, "which fuller knowledge corrects. As we stood on the mountain of bones looking out over the illimitable Desert of the Dawn, we believed for the moment that all life was extinct upon the whole vast planet of the innumerable suns. True, Herron believed that life still survived in the deepest caves on the farther side of the planet. But the rest of us doubted.

"Herron was right: those caves were inhabited by the descendants of the fourteen hundred men and women of science who, as Dill related, abandoned the Assembly to its inhuman infamy. We stood upon the mountain in a certain age of its dying history. Long before that age all natural plant life had vanished from the face of the planet. For food the surviving scientists were compelled to resort to chemical substances of their own creation.

"Before calling upon Herron there is one point that I should like to make clear. On another ascent of the time stream by myself—starting from the shadow life of the future—I succeeded in reaching that part of the stream which bore the reflection of the later cave life of those scientists. As in Dill's case I seemed to become one of them, inhabiting his mind and body. And in that remembered existence I, as did Dill in his experience, relived an act of the past drama of our race. My life in the caves coincided with the final stages of our civilization in that epoch. We were about to migrate from the dead planet.

"For nearly eighteen thousand of our Eosian generations the men and women of science had toiled incessantly to discover two secrets of nature which they knew would place them forever beyond the reach of hunger and of the beasts that once slumbered in all men. It was during my cave life that the long search came to its triumphant end. We found what we sought. It was a key to unlock the future to us and make man the undisputed master of the universe. It was the golden key that unlocked for mankind the gates to his true Golden Age—his happy life in Eos. We prepared to quit the Dark Place forever.

"But before going we determined to leave a record of all our struggles toward knowledge and the light. We took this resolve for a simple reason. The invisible seeds of life are strewn like an impalpable dust between all the stars of the heavens and throughout all space. The drifting motes from living planets bear on them the lowly organisms from which all life—even the highest, of which we are the type—ascends through the age-long workings of evolution. Now, we thought, the Dark Place may again, by such means as these, become a living sphere once more in the slow course of aeons, and again teem with intelligent beings. The barren soil too, in the slow, secular changes of its atoms, would break down into new elements capable of again supporting the complexity of intelligent life.

"It was for our successors in the Dark Place that we graved our records on monuments of the most durable metal of which we had knowledge—the same as that of which these walls, unchanged and uncorroded since their erection by our first ancestors in Eos, are constructed. For our successors, we reasoned, must sometime attain sufficient intelligence to recover our dead speech and, deciphering our records, escape the misery that slew our race. We left a record of all our discoveries for them to enjoy without the slow, heartbreaking labor of independent search. Having built the monuments we set out on our age long voyage of discovery.

"In conclusion, I wish to amplify the testimony of Dill in one essential detail. The men and women of science quitted that infamous Assembly because they had been commanded to misuse their knowledge. This I learned from them directly. The Assembly ordered them to destroy all the race except the twenty thousand members of the Assembly. Am I right, Dill?"

"I forget," he replied thickly. "My memory of the time stream is fading."

"My reading of the monuments confirms you," Herron said.

"Then that is all I have to say." Savadan, before taking his seat, faced Cheryl and Beckford, and addressed them in a low voice.

"Man and woman," he said, "you will decide whether our descendants shall inherit the Beast State of the past or the Golden Age of the present. Think, woman, of the unborn children."

"From his reading of the monuments," Palgrave said, "Herron will give you the essential details bearing on the present and future of our race."

CHAPTER XV

The Race Against Time

"SAVADAN has told you of his life with the cave-dwellers who became our first ancestors in Eos," Herron began. "Culman will relate how they came to Eos, and how they hid the secret of their greatest discovery on this Plain of the Five Pillars. I shall merely tell the story which our ancestors graved on their monuments in the Dark Place. The records they left were extensive and complete. As it would take too long to give you an account of all, I shall select only those details that may influence this man and woman in their decision, and perhaps change the whole flow of our future history.

"Before beginning, however, let me supplement Savadan's modest statement in one particular. He has told you how we finally succeeded in reaching the monuments. What he has omitted is his own leading part in that important discovery. Without his able, fearless guidance through the black spaces of oblivion, not one of us should have returned with a living mind to Eos.

"Again and again he braved the darkest wildernesses of the past to recover one or more of us who had been lost, and brought us safely back to light and understanding. It was he who kept us together. Meeting with him we compared progress, so that each, at every stage of the journey, knew what his fellow explorer had accomplished, and set out again with a keener intelligence toward the unknown.

"He only, of all our party, never wholly lost his direction in time. It was he who discovered in mid stream that the flow of time is closed; and therefore was he enabled to turn back to Eos at the critical moment, instead of plunging deeper and deeper into the unplumbed future. So to him belongs whatever credit is due our venture. If Eos is to be saved from ruin by the outcome of our testimony, it will have Savadan alone to thank for the deliverance.

"Passing now to my own experience among the monuments, I may state that I did not see their erection, but only the completed works. A bad slip into the time stream just as the scientists emerged from their caves to begin the work of building, deprived me of the chance for which I had hoped. I returned to the Desert ages long after the monuments had been set up and inscribed, and ages after the departure of our ancestors from the Dark Place.

"I was alone. The others somehow had lost me in the time stream. At first I failed to recognize the Desert as the same place as that which Palgrave, Savadan and we others had visited together. The vast deposits of bones had completely disintegrated and crumbled to less than dust. No longer were there shadowy mesas and steep hills of ruin visible; all had sunk down, leveled in fine dust; and the very dust had evaporated, atom by atom, to lose itself forever in the brazen heavens above the Desert.

"With a sense of awe at the vastness of time, I raised my eyes from the Desert to the unfamiliar sky. A dull crimson glow suffused a full three-quarters of the heavens, shedding over all the desolation a dead light like blood. Then I remembered the huge, compact spiral of dazzling suns which once, with an intolerable glare of fierce white light, had etched every bone on the Desert. This vast blotch of dulled red fire in the heavens was that same seething swarm of suns which we had seen rising above the wilderness of bones. Ages upon unnumbered ages had elapsed between my two visits.

"Those millions of suns were far toward their dissolution. Dying fast, their swarm had loosed its bonds, and sun by redder sun went wandering aimlessly away from the clustered hive to die alone in the cold blackness of outer space. Even as I watched my sense of time quickened, and I perceived the slow creeping motion of the individual suns, as star by redder star dissolved from the dying swarm and sought the void beyond. And ever the sullen light on the Desert deepened; and what had been a blood red glow on the barren sands took on the black hue of death.

"Alarmed then lest the light should expire before I had completed my appointed task, I stumbled over the Desert in search of the monuments. I moved as in a dream. It was as though I were peering down through darkened glass at the slow struggles of another explorer. And that other, I knew by some intangible bond between us, was myself.

"WHERE, in all that boundless desolation, were the monuments? To my ever quickening sense of time the darkness deepened visibly from above, like the swift gathering of clouds pregnant with thunder. But no flash cleft that black path, lightened only by the dull crimson glow of the last dying suns.

"For ages I wandered thus over the Desert, groping for the cold metal of the monuments. My sense of time, ever acuter and quicker, summed up and revealed the changes of aeons in the glancing of an eye. The creeping dispersion of the last faintly glowing suns—a motion so gradual that not a thousand of our generations spent in ceaseless watching might detect its traces—this infinitely slow dissolution flashed across my vision like a streak of red fire. The last dulled crimson suns ran from the heavens and rushed bleakly out to the void and cold of limitless space.

"The rush of those last suns from the dwindled swarm was like something, I imagined, that I had seen in another existence. With a shudder of repulsion I remembered how, once when I was a child, I had torn apart one of the globular nests which certain spiders spin about their young. And in watching now the outward rush of the suns, I recalled with the same shock my childish loathing at the innumerable swarm of small red spiders which had darted in all directions from their ruined nest.

"With a sharper shock I realized that the last light had expired, and that I was reeling over the Desert in utter darkness. At the same instant my outstretched hands touched the cold metal of a monument.

"Running my fingers over the surface of the metal I felt that it was covered with deeply cut signs in some unfamiliar character. There was no light; the last red sun had rushed from the heavens. How should I ever decipher the writings? Fingering the inscriptions, I felt my way round the monument. It was a low, very broad pillar, about a hundred double arm spans in circumference, and a little higher than my head. A deep, vertical groove from top to bottom evidently separated the beginning of the inscription from the end.

"I started at the groove and fingered my way around the highest line of the inscription, first in one direction, then in the other. The incised symbols were all strange, and their angular outlines gave me no clue to their meanings. Line after line from top to base I tried with no success. Once I found a clue, but in the dark I lost it. Certain of the symbols evidently represented the smaller numbers. If only I might see the whole inscription, I thought, surely I could wrest out its secret. And while I groped I became conscious of a keen, and ever keener, sharpening of my time-sense. The pent up ages, suddenly released from the iron barriers of past eternity, rushed through my mind like a strong wind. At length, worn out with blind groping, I sank down on the sands, resting my head against the cold metal, and passed into a profound sleep.

"How long I slept I had no means of judging. On awakening my first sensation was an amazed wonder at the superhuman rapidity and keenness of my time-sense. Changes so slow that a million of our generations would scarcely detect them, flashed before my eyes like the changing play of swift flames. Then, in a new amazement, I perceived that the whole desert was alive with the faint, flickering glow of some phosphorescent decay.

"My quickened senses told me that this interpretation of the pale, greenish light was indeed correct: the desert, the monuments, nay, the whole planet, were passing through their dissolution to an everlasting nothingness. For the phosphorescent flickerings were the evidence that the atoms of the metals and the sands of the Desert were disintegrating into their primordial electricities. The incessant ejections of those minute particles of electricity rendered visible the dying matter—the metals of the monuments and the sands of the Desert—of which they were the natural, inevitable decay."

Herron paused, glancing for a moment at the metal walls of the laboratory, with their deep-cut legend admonishing Eos to remember the beast.

"The metal of these walls," he resumed, "in any other place than Eos would glow with a similar phosphorescent light to the eyes of one whose time-sense was quickened as was mine. Here we have arrested the natural decay forever; for we dominate nature. We check or hasten at will the disintegration of matter into energy. But on that dead planet nature still ruled supreme; and the decay to utter nothing of all things material, though long in reaching its void end, could not be indefinitely delayed.

"To picture what I perceived with my quickened mind, imagine that we had left the metal of these walls to the mercy of nature; and think, if you will, that we are watching them with our present slow time-sense. Should we see the same phosphorescent glow that I saw? Clearly not; for so infinitely gradual is the disintegration of the atoms into their ultimate particles of electricity, that we might watch here a million generations and detect no change in the texture of the metals. Nor would a single letter in the carving of that reiterated inscription lose the cutting sharpness of its edges; not one spot of shining metal would become perceptibly duller throughout our age-long vigil.

"From this picture you may visualize some faint idea of the superhuman quickening of my time-sense in the Desert of the monuments. For I saw the infinitely slow natural breaking down of matter into energy as one continuous stream of flickering light. And simultaneously my perceptions were quickened, so that the prodigious labors of an age were compassed in one throb of my pulse. In the twinkling of an eye my mind performed the task of an aeon. Thus I read the monuments.

"ON RISING to my feet, and peering across the green glow of the Desert, I perceived that the monument against which I had slept was but one of thousands. Before me stretched long parallel avenues, clear to the far horizon, of similar broad, low pillars. About each clung a flickering veil of the cold, greenish flame, the shroud and visible evidence of its decay. By the light of those clinging flames I read the inscriptions.

"It was the beautiful rhythmic regularity of the symbols for numbers that gave me my first clue. Having deciphered the system of numeration, it was but a short leap thence for my quickened mind to the symbols for the elements of matter. From these in their several combinations I saw in a flash the structure of that dead language in which the inscriptions were written; and in the beat of a pulse the secret of all lay naked to my mind.

"From monument to monument I hastened in the ardor of my quest. One circuit of each was sufficient to reveal me all its mysteries. I doubled my speed; for the steady brightening of the green flames told me that the decay quickened, and that the obliteration of the inscriptions was at hand. It became a race between my mind and the disintegration of the metals: should I succeed in deciphering all the monuments before the green flames, rotting deep into the metal, had burned away the last trace of the incised characters?

"For a time I hoped. I had read all but twelve of the pillars. From the great number—many thousand—which I had deciphered, I had learned all the history which I shall summarize very briefly in a moment. My skill had increased beyond all measure, and I anticipated an easy conquest of the remaining twelve monuments.

"Approaching the first of them, I began at the vertical groove, and started to read the inscription. At first I experienced no difficulty. The characters gave a clear, concise account of the circumstances attending the greatest discovery which the cave-dwelling scientists had made. It was the discovery which enabled them to quit their dead planet and seek another in the unexplored depths of outer space. This part of the inscription was merely historical. I took in its meaning at a glance. It related in minute detail the innumerable failures which preceded the first hint of success. Then followed this strange declaration:

" 'At last we have uncovered the supreme secret. To our minds has been revealed the true and simple nature of gravitation. Once seen, by one skilled in the mysteries of numbers and geometries of space, it is unforgettable. But few would ever look for this truth where it is to be found. Even to us the wonder of its simplicity is still fresh. We sought to find the secret of gravitation. In contemplating now the outcome of the search, we have but three thoughts: wonder that the mind of man should ever so greatly dare as to approach the supreme mystery; wonder that any man should ever have imagined his mind capable of resolving the mystery; wonder that the impossible of impossibles has been accomplished. Few indeed would ever seek this truth where it dwells.

" 'It binds together into one individual whole all the laws of nature. Gravitation, as we have seen it, is the one all-pervading reality; present everywhere and in all times, it makes nature as it actually exists possible; for without this gravitation, nothing could exist. There would be neither space nor time; it is the union and essence of both. Without gravitation there could be no matter, no light, no heat, no electricity: no shadow of matter or energy in any form. For it is the framework of space and time about which all things, from the atom to the star, are built and have their substantial being. Let this hint suffice.

" 'We have found the secret, and we shall preserve it. Nay, more: we have discovered how gravitation can be controlled by our wills, and become our drudge; as of old we subjugated heat, electricity and light to the slavery of operating our cumbersome machines. More yet: in making gravitation our servant we may pass freely, and in these heavy bodies of ours, out of this dead place into the living, boundless universe.

" 'All the planets of all the stars are ours to visit. It is in our power to explore the illimitable heavens, as our ancestors of old explored all this place of death. And although our mastery over matter and all energy puts it in our power now to make this desert bloom once more as a garden, we shall quit this place of evil memories forever, and seek a clean planet, there to establish a new life untormented by the beasts in men.

" 'Now before quitting this Desert we shall leave the record of two resolutions, and all they imply, on the twelve monuments remaining, of which this is the first. Let him who can decipher the last eleven. On them is all the secret of gravitation, and all the lore whereby man may bend the secret to his will.

" 'Now, our first resolution is this: Knowledge once attained shall not be concealed beyond all hope of rediscovery. Therefore, on the last eleven monuments the secret is engraved, but in a different tongue, and one which we ourselves have all but forgotten. It is the symbolic language in which the oldest of our traditions were first handed down to us; and only after the labor of unnumbered generations did our men of science succeed in finding the key to it. Let him who has the wit to retrace their footsteps decipher the secret and follow us through the voids of space to the uttermost stars. For this planet is black with the memory of war.

" 'Our second resolution is this: We ourselves shall not again migrate from one planet to another. If in that place to which we are going the beast again bares its fangs, we shall stay there and perish utterly in a universal slaughter. For in that case it were better that we and all our kind be blotted forever from the universe than that our accursed seed be cast upon another planet.

" 'If in the place to which we are going the spirit of war rises from the dead to rend us, we shall not flee before it. We shall hasten to meet it, and in the clash of that meeting annihilate ourselves, our place in the universe, and all memory of both to the last atom. For war is an evil not to be endured. If by all our labor in the caves we have not exterminated the beast from our natures, then the life to which we are going is worth no man's living. And if we have thus failed, we shall not again blight another planet. For between a place given over to hatred and killing, and one devoid of all life, there are not two choices. Better the utter sterility of this Desert than the fruitful greenery of teeming plains where the beast crouches in every heart.

" 'So this is our resolution: We shall live free from hatred and war in the place to which we go, or we shall perish there. And lest our descendants there should reverse this judgment, we shall stamp out the secret of gravitation; so that they, should they rouse the beast, shall likewise perish before they defile the universe.

" 'The secret is on the remaining monuments. Read it, who can.' "

CHAPTER XVI

"Use the Secret"

"DID you read the last eleven monuments?" Culman asked eagerly, leaning forward.

"No. The dead characters baffled me, and the phosphorescent decay outstripped my intellect. The monuments, the illimitable Desert, the whole vast planet itself, had disintegrated in the cold green flame ages before I grasped a few unfamiliar meanings of the symbols I had seen. For now and then through the quickening green flames I caught glimpses of the meaning; but they were fragmentary, and to me unintelligible. Before I had grasped the clue, all vanished into the void of everlasting nothingness.

"Perhaps one trained in the physical sciences might have succeeded where I failed. All that I gleaned was that the control of gravitation depends in some way upon the other capital discovery of the cave scientists: it is bound up inextricably with the process for transmuting matter into energy and back into matter."

"Ah," Culman sighed, leaning back. "I suspected so much from my reading of our legend of the Five Suns. And when with my own eyes I saw the secret in full operation, my guess was confirmed."

"And I too," Ducasse murmured modestly, passing one lean hand over his stomach. "But I have not yet had visible evidence that my theory is rational."

"And is this all that the monuments told you?" Cheryl asked with a faint scorn.

"It was not. Were I to report all the histories which I deciphered, I should speak without ceasing for ten generations," he answered with a smile. "But as your love makes you impatient of truth, I shall be brief. I need summarize the inscriptions of but two monuments of all those thousands.

"The first recorded the battle of the cave scientists to overcome hunger and forever vanquish it as man's insatiable enemy. The body must be fed before the spirit can grow; and to feed the body there must be fertility assured the fields against all accidents and secular decay. And before the mind can take its own, the body must be freed from brute labor. In seeking to conquer hunger, the cave scientists also overcame toil. They put in our hands ease and plenty: therefore are we what we are. The tangible evidence of their victory is our great ball of undying fire. For with the absolute control over the physical forces of nature which the double transmutation of energy into matter and of matter back into energy gives us, we need no longer dread the dry beginnings of a desert and the ultimate starvation of our race. We command, nature obeys.

"But the process which to us is so childishly simple cost them untold labor and many lives to discover. Time and again the first part of the process, which breaks down the atoms into the two electricities, burst from their control in whirlwinds of seething destruction, and all their labor went for nothing. But in the end they conquered, and we are their inheritors of their victory. Hunger, unceasing labor, and the base servitude to untamed brute nature are for us incredible traditions.

"On another monument I read the record of a greater victory. In minute detail those grim pioneers to happiness described their struggle to subdue the beast in man. I need not weary you with the history of their innumerable failures and slow successes. Clue after clue was followed to its disappointing end, until almost of itself the truth was revealed. You, woman, know that truth, although you deny it; and you, man. It is summed up in our marriage sanctions. For it was those remote ancestors of ours in the Dark Place who devised and perfected the intricate technique of that life and character analysis which is the dull routine of this vast laboratory. 'Remember the Beast.' That is the message of the monuments to you, man and woman."

"And if we forget, or ignore the message?" Cheryl asked.

"This is the prophecy of those who built the monuments:

" 'The law of reason is the law of science. When men and women violate the law of reason, and mate in defiance of scientific truth, then shall the beast be born again. For there is one way, and but one, to eradicate our inherited lust toward hatred and killing; and that is to breed it out of our minds and bodies. Follow to its least detail the law of reason and the teachings of sane science, and your race will be clean and happy. Defy that law in one particular, and the beast will destroy your race as it slew ours. We have put into your hands the key to unending happiness. It is for you to unlock the gates to a future of light and reasonable joy, or to throw away the key and perish miserably. And if perish you must, let your ruin be swift. We who have known war advise you thus in the counsel of despair.

" 'And lest a second Assembly as selfish as was our own destroy the helpless, we command you to be free. Let no man or woman interfere with the life of another against that other's full and intelligent consent. To the future we commit you. Remember the Beast.' That is all."

HERRON sat down. Neither Cheryl nor Beckford sought to detain him, or to ask him a further message from the dead.

"Is not there one of our legends," Cheryl asked, looking Palgrave squarely in the eyes, "which says: 'When ruin threatens Eos discover the secret of the Five Suns which shine above the Plain of the Five Pillars'?"

"There is," Palgrave answered.

"Then perhaps one of you explorers of our past discovered that secret?"

"Perhaps. Why do you ask?"

"Because you and all the Council," she flashed a defiant glance over the set faces before her, "insist that my marriage will unleash the beast. Now, if our all-wise ancestors knew so much about my marriage, doubtless they knew also how to avert the ruin which it threatens. And they secreted the knowledge," she concluded with a mocking smile, "in the legend of the Five Suns."

"You do not yet believe, woman," Palgrave answered calmly. "Well, we cannot now enlighten the darkness which you have inherited. Either you are accessible to reason, or you are not. Nothing we may do will change your nature."

"You might tell me what you discovered about our Five Suns," she begged, with a winning smile.

It was impossible to resist this girl when she strove to conquer. Palgrave averted his eyes from her face.

"Culman," he said, "if you think it wise, you may tell this woman what you and Sylvester witnessed."

"I think it inadvisable to reveal everything at this time," Culman replied slowly. He rose, and faced Cheryl.

"Why?" she demanded prettily. She was still smiling, but her open beauty had no snare for Culman, the hard man of physical laws and mechanical sciences.

"Because," he answered, "our first ancestors in Eos disliked idle curiosity." Disregarding the anger in her eyes, he continued evenly. "They walled their knowledge about with difficulties all but impenetrable. For though the secret of the suns is a remedy for all our threatened evils, yet so drastic is it, that we should be justified in applying it only in the direst extremity. It is a knowledge not to be exposed lightly."

"Did you unravel the secret?" Beckford sneered.

"Not wholly. But I saw that which will enable me to master it all before your son—should you and this woman have a son—reaches manhood. That will be time enough."

"But can you tell us nothing of what you saw?"

Cheryl pleaded. "Even a hint might win us from our love," she added, insincerely, I thought.

"The little that I may safely tell you now will not change your decision," Culman answered gloomily. "If the picture of the beast state which Dill showed us leaves you unmoved, no revelations of mine can shake your obstinacy. You disbelieve the prophecy of the monument builders. To your mind it is absurd that a single rash marriage in defiance of the law of reason should send our race back to war and brutehood. But to us who have looked upon the past with the living eyes of the dead, the prophecy is but the simplest statement of an inevitable fact. Defy the law of reason, and Eos shall be ruined."

"'Shall be'? You speak as if you had authority," Cheryl interrupted sharply. "Who are you to say how Eos shall be rewarded for the love that we shall bring it?"

"It is not for me to decide," Culman answered gravely. "The founders of our civilization have advised us: 'When ruin threatens Eos, discover the secret of the Five Suns which shine above the Plain of the Five Pillars. By that secret you shall avert the ruin which overwhelmed our people in the Dark Place. *Use the secret, it is the better thing.*' Believing that our ancestors were wiser in life than we, I shall carry out their injunction to its last letter."

"And use the secret?"

"Yes."

"I wish I knew what it meant for Eos," she sighed. "Tell me what you saw."

"With my eyes, yes; with my mind, no," he replied firmly. Her wiles were wasted on him. "See through my vision, if you will, what I saw on this Plain of the Five Pillars before these laboratories were built, and before the kindling of the Undying Fire. Then, if you mean to renounce your love and cleave to reason, your mind will see the truth beyond the vision without help of mine. But if still you persist in your folly, love will blind you to all truth, so that in perceiving it with your own mind you will dismiss it for a baseless dream. This, then, is the outward evidence of what Sylvester and I saw."

PAUSING, he regarded her for a moment with saddened eyes which, for the instant, grew strangely old and kind. Then, speaking directly to her, he resumed.

"Twice on the glassy waters of the time stream I saw the shadow of our earliest life in Eos. Twice I entered the busy life of those moving reflections, and became one of those who toiled like giants to lay the corner stones of an imperishable happiness. Once I entered that forgotten life alone, and once with Sylvester.

"On my first visit to our past in Eos I was alone. I saw the landing of our ancestors on this happy planet, then a rank waste of tangled forests and fetid jungles. Softly and lightly as snow they sifted down through the steaming atmosphere. With a sense of wonder that any material thing should fall so gently, I watched that gradual descent which defied the pull and tug of gravity. For those things that fell so slowly upon the reeds were no feathers, but material bodies, heavy and rigid, and still harder than stones from their rush like light across the absolute cold of void space between the stars."

"Did they come in machines, or did each arrive alone in his naked body?" Beckford asked.

"That I cannot see again," Culman replied, rubbing a hand across his eyes. "For I lived and worked with them; and one of their first tasks was to erase the secret of gravitation from every living mind. Within twelve generations they had succeeded. The knowledge was lost, but not forever. What once the mind has known and forgotten may be rediscovered."

"By you?" Cheryl asked.

"Perhaps; should there be need. By Sylvester and myself."

"Was the landing of our ancestors all that you saw?"

"No. I saw much more. But I will tell you little. In Eos our ancestors met again an ancient enemy which their race had long vanquished and forgotten. Disease attacked them from the rotting jungles and sweating forests with poisonous insects and the bacteria of decay. For all their physical and mechanical sciences they could not again drive back their relentless enemy. It was a form of warfare which the race had outgrown. They fell sick, and three-quarters of them died not a hundred paces from the spots where they landed. The more resistant conquered their weakness and turned upon their ancient foe, fighting valiantly with all their knowledge.

"Trained as they were in the minute observation of nature, and bred for thousands of generations to the task of subduing its brute forces, they soon rallied and drove back death, at least for a season. But they could not in one generation, no, nor in tens of thousands, cleanse this planet of all its natural evil. They lost the immortality of the body; and we, their descendants, have not yet recovered it."

"And may they never!" Savadan exclaimed. "Sleep after work is grateful, and sleep after pleasure more grateful still."

"That is the saying of an old man," Cheryl broke in spiritedly. "Who that is young, and in the vigorous happiness of a perfect body and a strong mind, looks forward to death? When we vanquish disease we shall gain perpetual youth. I, with my strong, sweet love pulsing through my veins, would live forever!"

"And without your love?" Culman asked.

"I would die. For I should become old, and tired of things."

Palgrave started. "I remember one—a man, I think it was—who said he was tired of things. But it was in the shadow life beyond Eos. . . . It was in a garden . . . and he was speaking by a tree with large, white blossoms. . . . There is no fragrance in Eos like the sweetness of those flowers. Nor is there any sorrow so great as was that man's."

CHAPTER XVII

"Explore the Future!"

CHERYL looked curiously at him. "I too have dreams of a garden," she said softly, "with strange trees and stranger flowers . . . blue, like our sky, and glorious yellow, like our fourth sun, and white, like the fifth. But," she murmured, lowering her voice, "it is only a thing of sleep. . . . Did that man know what love is?"

"I forget; but somehow I think he felt what you feel, and knew what you know. . . . Culman, continue, if you will."

"There is but one other detail of my first ascent to the beginnings of our life in Eos which I care to relate. In that remote past our five suns rose and set; light succeeded darkness, and from this plain I watched the fiery magic of many dawns and sunsets. And each sun was a pure, dazzling white. When the suns went down we slept in darkness beneath the stars; for the light that shines now everywhere in Eos had not yet been created."

"It is a lie!" Beckford blustered. "This plain has always been light. The five suns never moved across the heavens!"

"You may have the truth. Who shall say? With our own eyes we watched the risings and the settings. Sylvester, you tell him what you saw when we visited this plain together."

"A barren mountain of precipitous rock where these Council Chambers now stand," Sylvester began, "was our first distinct vision. And it was a reality.

"Once, as the five white suns swung up above the distant forests, we stood far out on the plain, watching the mountain. By some strange forward reach of the memory we knew what we should see. And as the first rays of the risen suns turned all the mountain to shining gold, we saw what we anticipated.

"Down the steep causeways of the mountain, men no bigger than motes trickled like fine black sands to the plain below. All through the long darkness they had been toiling on the summit. Reaching the base, they scattered and ran in all directions far out onto the plain. Steadily, swiftly the five white suns mounted the heavens, their intense rays beating ever more fiercely down on the vast plain; but those fleeing dots never paused. A racing group of the swiftest sped toward us, and we saw them assume the familiar likenesses of men we had once known and loved, but forgotten. They joined us, gasping out their exultation at their great work done in the darkness.

"'We have kindled the undying fire,' they panted. 'Watch the mountain! Hunger and brute labor are forever banished from this place!'

"Even as they stumbled toward us and sank in utter exhaustion, the whole mountain burst into an intolerable glory of white flame. And as it took fire, straight up from its blazing crest shot one broad shaft of blinding violet light, piercing the blue of the heavens like a sharp spear, and ringing on unseen and invisible into the void infinities of space. Then came the first strong blast of the wind full in our faces from the burning mountain, a sharp, stinging breath, colder than ice; for those flames were cold.

"'The suns, the suns!' they panted, too exhausted to raise their heads from the grass where they had fallen. 'Watch the suns and tell us what you see.'

"Again by that forward reach of the memory we anticipated what we should see. With a sudden rush the five white suns leaped up the sky toward the spot where the shaft of fierce violet light seemed to penetrate the firmament. And as they swung from their accustomed paths, wheeling in wide spirals around the violet shaft, the blazing mountain took fiercer flame, dwindling rapidly from a lofty peak to a molten hill of incandescent rock. Circling the shaft in ever narrower spirals, the five suns, still dazzling white, approached the zenith with a rush. One of the five broke from its mad orbit and soared directly for the spot where the motionless pillar of rays pierced the heavens. Another followed, and another, until all five were leaping like young giants to their destiny. Would they crash together in one shock of transcendent white fire, or would they graze each other at the meeting place, and surge beyond?

"We held our breath: our great experiment and the future happiness of all Eos hung in the balance. The first white sun shot through the violet rays—or rather, through their invisible shaft in the cold void of outer space—and the light of that sun was changed. Instantaneously it became red, and a vertical pillar of red light moved with it across the firmament, resting, it seemed, on the hard blue of our sky.

"Sun followed white sun through the same invisible shaft, until in all four pillars of mellow light—a red, a green, a golden and an amethyst—oscillated back and forth in stately rhythm about the violet pillar from the dwindling mountain.

"FOUR of our suns had become as Eos knows them. The last approached the violet shaft, hesitated, then rushed directly for the centre of the rays. Its short, swift journey ended, this sun too shot down its column of light. And in that instant the violet pillar from the mountain vanished; and with the suddenness of death, all five suns came to rest. They were as Eos sees them, and in the identical configuration: a sun of gold, a sun of amethyst, a red sun, a sun of the purest white, and the green sun which our people call the star of hope. And their five pillars of light rested on the heavens above this plain.

"We lowered our eyes to the flaming mountain, knowing well what we should see. The huge mass of it had shrunk to a low hill of blinding light. Gradually, as we watched, the light took shape. It drew together, its ridges and ravines coalescing, like a drop of molten metal in a furnace, into a perfect sphere compact of dazzling fire colder than ice.

"'We have kindled the undying fire,' I heard one of the exhausted toilers saying. 'Hunger and brute labor are forever banished from this place.'

"With his triumphant joy still ringing in my ears, I awoke in our Chamber of Undying Fire, the visible work of his mind before my eyes."

"And is this all the truth of our legends?" Cheryl asked with a smile as Sylvester took his seat.

"No; but it is enough," Palgrave replied. "Shall Dill tell you more of the beast state? Would you hear more intimately what war is from one who has seen it? Or perhaps you long to know by what perversion of science those high towers in the Dark Place destroyed the famished and the helpless, the young men and old, the girls and the women?"

"No, no!" She put her hands over her ears. "It is enough."

"Then do you believe now the truth of our legends?"

"I cannot."

"Why?"

"They contradict my love. Oh, love is the living truth, and all your sciences dead shadows of unprofitable lies!"

"The dead have spoken, and you have heard. Woman, will you renounce your love?"

"Do not think me stubborn," she said rising. Her face was troubled and unhappy. "I too seek truth, but by another path. If only I knew where either leads I should not stand here doubting. Councillor Savadan tells of a shadow life far beyond us in the future, where of all our Eos but one dim legend of it is unknown. And that life, for half the wretches who support it, is a misery. Is my love to bring this upon the race? Oh, I think not! Still, if only I knew that it must, I should follow your path and obey science. Rather, I should die; for without love my life would lose all meaning. Do not think me selfish. I am not that. You, who have not known love as I know it, cannot understand. It is for my lover that I plead, not for myself."

"I believe you, woman," Palgrave said. His eyes for an instant filmed over, and he seemed to sleep. Then, recovering, he continued. "Science has not all the truth. For all the truth is not known, and never will be. Even though there be limits to space, and the stars are numbered, yet is the universe infinite. For that is the paradox and essence of life, which sets no bounds to the creations of the mind or to their number. And one of these may be a new truth that you call love. And perhaps the way of love may after all be but a gentler science than the law of our fathers; and Eos in the end may be the happier for it. Only the future knows. Woman, you are free. What is your decision?"

"Only the future knows," she replied dreamily. "The words are your own." Then, with a sudden flash of rebellion she shot a question at Savadan.

"You, Concillor, explored the past?"

"Yes," he answered calmly.

"And saw the truth of all our legends?"

"The others and I have told you what we saw. It was the truth."

"Then," she cried triumphantly, "explore also the future, and bring me back the ripe fruits of my love!"

"We have done so, woman."

"How? What fruits have you shown me?"

"The shadow life of pain and wretchedness. The misery beyond Eos where the only living memory of us is a dim legend called the story of the Golden Age."

"It is a lie. Such wretchedness can never be where love is."

"If that is the truth," Savadan answered with a smile, "then the love those wretches speak of in the shadow life is a bitter myth."

"IT IS not a lie." The unexpected words which Beckford uttered brought us to our feet. "It is the truth," he went on. "I too visited that shadow life of which the explorers told us. Of the past I saw nothing; but this other thing I saw clearly, shining like a dimmed reflection on swiftly moving water."

"You?" Cheryl gasped in amazement. "But you were not sent into the time stream. How then did you see this vision of the future?"

"In sleep," Beckford answered. "And I dreamed that in the shadow life beyond Eos you still loved me, and I, you."

"It is enough!" she cried joyously. "I have decided. I will be free and follow my love. And my lover and I will teach our new truth to all Eos. Then, in the shadow life beyond, the miserable shall have always within their reach an unfailing and eternal happiness. Our way is truth, come ruin, come oblivion of us all, come what may!"

"So be it," Palgrave said. "The Council will rise. It is ended."

"Wait," I said. "Woman, will you answer me one question?"

"What is it?" she asked. Her face again grew troubled, and she glanced uneasily at Beckford. Her right hand sought his; and they stood there facing me, their hands clasped together as if for friendship and protection.

"Would you," I asked, deliberately brutal, "for the sake of your love, willingly see that small lover of reptiles slain? You remember how he ran from us with his treasure, out there by the scarlet tree not far from these Council Chambers?"

"Stop! Not that, not that—"

"Would you see all the children in Eos sleeping their long sleep under the ghastly dew of which Dill told us? Would you, for this untried love of yours, deliver them up to war?"

"No—never!"

"Then renounce your love. Our testimonies predict that ruin shall issue from your marriage. All may be false: our traditions lies and our legends meaningless. So too the law of reason may be an outworn superstition, and your love the everlasting truth. Yet on the chance that somewhere in all the dark traditions of our race there may shine one ray of truth, your renunciation is not too great a sacrifice for us to ask you. Give up your passing love for this man, and win instead the unchanging love of Eos and all its children."

Her hand slipped from her lover's, and she bowed her head.

"You have convinced my heart, but not my reason," she sighed, turning sadly away. "I renounce my love."

In silence we watched her walk toward the far gates of the laboratory. Beckford stood alone, bewildered. She was some ten paces from him before he spoke.

"It is over," he said, passing a hand that shook across his eyes. "It never was more than a dream. I have slept too long."

Hearing his despair, she turned. For an instant she hesitated. Then she was in his arms.

"I cannot," she sobbed. "Love is too strong."

"So be it," Palgrave said, and his eyes filmed. "Councillors, though we ban their marriage, let us wish them happiness according to our immemorial custom."

"Happiness in their marriage to this man and woman," came the age-old, sonorous response.

We filed from the laboratory, leaving them alone with their love. As he and I passed through the gates into the Chamber of the Undying Fire, Culman spoke

"We too," he said, "have kindled an unextinguishable fire."

CHAPTER XVIII

Culman's Experiment

CULMAN and I walked over toward the great ball of undying fire, and now stood moodily regarding its dazzling surface. Speaking more to himself than to me, Culman remarked on the efficiency of the transparent ray screen.

"It would be impossible to change the intensities of the radiations, I suppose," he muttered, "without first breaking down and removing that screen. And that would be dangerous."

"Yes," I agreed. "It is said that the rays which that screen filters out and stops will destroy flesh almost at the first impact."

"Then I must think of some other way," he said.

"But why should anyone wish to modify the radiations?" I objected. "The ball is operating as efficiently as it ever did—which means perfectly."

He did not reply at once. "One can never tell," he said evasively, "when it may be just and reasonable to change the present order of things. So it is well to be prepared for all contingencies."

Evidently he wished to conceal his motive for examining the ball so minutely, and I respected his unusual reticence. Always before he, just as did the other Councillors, had regarded the Undying Fire as commonplace. Now it seemed to fascinate him. His eyes followed every scintillation of the cold, incandescent surface nearest us with a hungry curiosity.

"So this is what they made in their flaming mountain," he said. "The original rock was thousands of times bigger and more massive than this ball. I must get at my tools again, and find out how our ingenious ancestors created that hard pillar of violet rays, also what caused it to change color and become invisible when our five suns finally came to rest. If I can't dislocate the whole puzzle after two hints like those, I'm not much of a mechanic."

His eyes shifted to the circular opening in the roof above the ball. For long he scanned every detail of the arrangement of the complicated tangle of transmitting machinery and selective lenses clustered around the top of the protective ray screen. Then his gaze traveled up to the glorious constellation of our five suns, resting on them in awed wonder.

"Have you discovered something new?" I asked at length.

"Yes," he said with a laugh, "a stiff neck."

I could have kicked him, but forebore, anxious to learn what he had seen. But he chose not to gratify my inquisitiveness.

"It will be easy enough to change the radiations if we ever have to," he said. "From any one of the principal machine stations up there we can get at the main pencil of radiation without exposing ourselves to any danger. Curious thing, isn't it, that we've never been able to analyze those rays that shoot straight up to the five suns?"

"In a way, yes. But still there are so many other things in our physical sciences of which we know nothing certainly, that perhaps it isn't so remarkable after all."

"What, for instance?"

"Gravitation. Our ignorance about that is dense enough to satisfy even the philosophers."

"Yes," he admitted grudgingly; "and how they do love to twit us with our lack of knowledge. Well, we scientists live and learn; the philosophers merely live."

Our discussion was interrupted by a soft voice behind us. Turning with a start we faced Cheryl. She was alone, and wasted no words in coming to the purpose of her mission.

"Councillor Culman," she said, "will you perform an experiment for me?"

"Gladly, Cheryl, if I can," he answered. Away from the formalities of the Council we all liked Cheryl and were her best friends—except when she and I had one of our numerous tiffs. Culman had always felt a warm, fatherly affection for her. He had no children, and looked upon her as a favorite daughter by adoption.

"What would you like me to try?" he asked, seeing her hesitate.

"Will you enter the time stream once more and look for something that I wish to know?"

He looked surprised, but expressed his willingness to try. Ducasse, Savadan, and Sylvester, seeing us engaged with Cheryl, joined us.

"Is it something we may share?" Ducasse asked.

"Of course," Culman nodded. "Ducasse, will you send me into the time stream again?"

"If you insist. But I won't guarantee to fish you out once you're in. Why this sudden enthusiasm for the disagreeable? It is quite unphilosophic of you, Culman."

"To oblige Cheryl," he replied. "Now," he continued, addressing her, "what is it that you wish me to look out for?"

"FIRST," she said, searching Ducasse's face with her serious eyes, "can you send him into the shadow life beyond Eos?"

"I'm not sure. But after the practice I've had lately, I can make a fair attempt. He must find his own way, though, after I start him. How is your sense of time-direction, Culman? Any steadier for your recent plunge?"

"Better than it was," he answered. "And Savadan's discovery that the time stream is circular, or what amounts to the same thing, closed, is a great help in orienting oneself. I'm not afraid to try it alone."

"Then, Councillor," Cheryl went on, "can you find out whether the people of the shadow life follow the law of reason in their marriages, or whether they mate according to the promptings of their own love, as have my lover and I?"

"No doubt I can ascertain that much if I once succeed in reaching the shadow life of the future," he answered with a bewildered look. "But why do you wish to know?"

"Because nothing in the universe matters but love as we two have discovered it. If we can be sure that we shall send that unchanged down the stream of time for our descendants to cherish, we care not what goes with it. But if that love be lost on the waters of eternity, then is our marriage an idle pleasure and our new truth a mockery. We would know, to pacify our hearts."

"Very well," Culman answered. "Though I deny the truth of your theory, I will do my best to find for it what you consider proof. Ducasse, are you ready?"

Ducasse was ready. In fact the word had barely passed Culman's lips when he sank unconscious to the cold metal platform of the ball. His face rapidly assumed the lifeless texture of translucent white wax, and he ceased to breathe. Cheryl gazed down on the rigid form with pity and terror struggling in her eyes.

"Oh," she cried, "if I had known it was so painful, I should never have asked him. Bring him back! Can't you see he is suffering hideously?"

But he was not to be brought back to life and intelligence at a word. Ducasse and Savadan worked over him till the sweat poured from their hands and faces; but still he slept the grim sleep of agony. Sylvester brushed them aside, and himself toiled with no greater success to lift the sleeper out of death. Palgrave and Dill joined us, and stood helplessly by.

"If only the ball would click," I hazarded, "he might return. We must wait. There is nothing further to be done."

But they did not abandon their struggle, and I helped them as best I could to end that ghastly trance. Suddenly I reeled, and knew that the ball had clicked although I had not consciously heard the sharp, metallic sound. For an instant I slipped into the stream; but it was only for an instant, and almost immediately I was back in Eos, a confusion of bestial yells and shouts of mad hatred in my ears, and a glare of innumerable blood-red and white fires on my retina. It was a glimpse of the most terrible reflection, I knew, on all the waters of the time stream that I had seen. By the living horror of that fragmentary vision of lust and hatred and killing, the Desert of the Dawn was a tranquil dream of peace. I found myself staring into the wide eyes of Culman.

"Did you see it too?" he groaned.

"Only one flash of it."

"I lived through it all from beginning to end."

"Where was it?"

"In the future. Less than one of their short generations farther down the stream from the time where you and I, with Dill and Palgrave, met Sylvester and Herron, and where we saw Beckford's shadow. Our shadows in that life will see it all before they die; Sylvester, you, Herron, Ducasse, Palgrave, long before you are old men. One of us—"

He stopped, biting his lips, with his eyes on Sylvester.

"What did you see clinging about my shadow?" Sylvester asked. "Was it a thin, greenish mist? Once I saw it myself, but I have kept my secret." His voice sounded numb.

"I forget," Culman muttered, and we did not press him. He bowed his head on his arms and groaned again. Recovering by the sheer exercise of his will, he staggered to his feet and faced Cheryl. She had watched the scene, unintelligible to her who knew nothing of the time stream and the shadow life beyond Eos, with a sort of frozen pain in her eyes.

"Those shadows mate according to your love," Culman said. "In the dim future beyond Eos they have clean forgotten the law of reason. I have brought back what you wished."

HER face brightened with happiness.

"Then my lover and I shall devote our lives to the proclaiming of the new truth—the truth of love!—to all Eos, so that those who come after us may inherit a new and everlasting happiness!"

She turned, to hasten back to her lover, radiant as the bright aura of her own joy. Then she saw my face.

"You," she said, "you . . . always the cloud upon your face. You do not like me."

"Why lie? I do not, just now."

"What have I ever done to hurt you?"

"To hurt me, nothing. To harm the future of Eos—well, let the future be its own judge."

"The future! Always the future. A little while ago it was the past, the past until I sickened of it. You are dead between two lives! Why don't you wake and live?"

"Because I would rather dream of love than live it," I laughed, "if it sweetens the temper as it seems to have honied yours."

The angry retort died upon her lips. She had seen something in Culman's eyes.

"Tell me what you saw," she demanded piteously.

"No. You have decided; and it was happiness in your marriage that we wished you. Enjoy your love while you may."

"Oh, what have you seen?"

"Only a dream. Perhaps it was a false reflection from our past that I saw, not a shadow of our future. Be happy, and forget that you ever saw my face after I had looked upon the stream of ages."

Still she did not move. She was thinking desperately.

"Is it too late," she asked, "to change my decision?"

"How do I know? All that is between you and your lover."

She flushed, then turned deathly pale. Again she lost herself in a maze of doubt.

"Councillor Savadan," she said at length, looking up, "you are old and wise. Tell me this. If these men saw the future of our race so clearly on the time stream, how is it possible for my lover and me, by any act of ours, to change that future? For if the future is there, already existing in time, must not we so live, do what we can to avoid it, that the future shall be verified? And what is this but to say that my lover and I are not free, that all our actions are known and their consequences inevitable before our minds conceive them? We are but dead leaves fallen on an ever moving stream, helplessly swept on toward what place the waters will. Is the freedom of our lives in Eos an illusion?"

Savadan thought long before speaking.

"You have asked me many hard questions," he replied, "but they are not unanswerable. Go back to your lover, and take what joy your life offers."

"You will not answer me?"

"Another time. Now we have much to prepare."

"For what?" she asked, a shadow of fear in her eyes.

"The future."

"Again the future . . . Well, I have made my choice, and it is too late now to unmake it. . . Councillor Culman, will you tell me nothing of this other thing that you saw?"

"I'll tell you this much," he smiled. "I saw that I must sharpen my old tools, make new ones, and labor without ceasing all the rest of my life in Eos."

"For what?"

"The future."

"Again . . . You also. Well, we too will toil for the time to come."

"And now go back to your lover," Palgrave advised her, "or he will think you have grown cold. Perhaps he has fallen asleep, waiting for you. Rouse him from his dreams to the living, substantial life of the present."

Without a word she left us.

"That last plunge was decisive," Culman said when she was out of hearing. He gazed up silently at the five suns for a few moments. "Come, Sylvester," he continued abruptly, "we must get to work."

"Will you use the secret when you find it?" Savadan asked.

"I will use it at the first hint of anything like what I just saw in the shadow life. Eos shall never suffer that. Our ancestors were right; the secret, and all that it implies, is the better thing."

"Then let us begin at once," Sylvester said.

As he spoke he turned from the ball and started to walk rapidly away. The next instant I saw him stagger and pitch forward. With Ducasse's warning shout still ringing in my ears, I was struggling for breath and reason in the darkened swirls of the time stream.

The incandescent ball had emitted a multitude of sparks.

CHAPTER XIX

Colonel Dill Reveals

A FAINT, musical tinkling, audible above the sharp operatic raspings of the toy orchestra, caused me to look idly down at the table cloth. The charred match head had just struck the rim of the Colonel's liqueur glass, and was now ricocheting over the edge of the table. Measured by the swifter time of this shadow life we had been in Eos but a small fraction of a second.

"What's the matter with you fellows, any way?" Beckford demanded irritably. "You all look as if you had seen a walking corpse."

Palgrave sighed, and his glance traveled from the perspiring musicians furiously sawing away at the grand finale of their hotch-potch from "Rigoletto" to the sawdust on the floor, and thence to the white faces and startled eyes about our table.

"We're in it again," he groaned. "This is an eating house called Sanguinetti's in a place—what's its name?"

"San Francisco," Beckford informed him drily. "If you had taken anything beyond the one sour pint of Dago red, I should say you were drunk."

He eyed Palgrave with a certain hostility. It was the first time that I had ever seen a hint of anything but the most cordial friendship between the two men. Palgrave still looked dazed. The rest of us were not yet sufficiently sure of ourselves to speak before Beckford. Clearly he had clean forgotten his life in Eos. For him, Cheryl's pledged lover throughout eternity, the future life was so vivid that he was totally unaware of ever having left Cheryl to enter it.

It gave me a cold shock to reflect that the man's real mind and body were now probably fast asleep in the main laboratory of life and character analysis. Perhaps, at this very instant in the real time which we had quitted involuntarily, Cheryl was bending over her lover's sleeping head, trying vainly to recall him with soft words of love to Eos and life.

It puzzled me to think that he should attain complete oblivion so easily through the medium of sleep; while we, for all our struggles in the time stream could not erase from our minds this image of the false shadow life. He, the novice, achieved absolute forgetfulness of real time without even an effort of the will; we, the tried explorers, were powerless to dispel the illusion of this imaginary time of the future. Nevertheless we remembered Eos more distinctly than on any previous lapse into the stream of ages, and had little doubt that we should soon again find our swift way back to reality. For the present, in the midst of the time stream, we moved as shadows.

This literally is how we felt and acted. All our thoughts and movements went on independently of our wills. The real beings that were ourselves in Eos thought and moved; and like the long shadows of men marching toward the setting sun, our distorted thoughts and jerky motions caricatured the truth with a mad consistency. But to Beckford all this was arcana.

"And if you still don't know where you are," he snapped, "I may tell you that this is Sunday night, April the fifteenth, 1906."

"Sunday night? Ha, ha! How insanely ridiculous—Sunday!" Palgrave burst into a roar of laughter. "How sublimely idiotic. *Sun*day? Why not *Suns'* day? There are five of them, aren't there?"

"Five what?" Beckford queried. His voice betrayed alarm. Evidently he suspected Palgrave of temporary insanity.

"My mistake, old fellow," Palgrave apologized, instantly seizing the truth of Beckford's temporary aberration. "I was thinking of the five full working days in the week. And that reminds me," he went on, "that I have a lot of work to get through tomorrow. What do you say if we adjourn? Or, if you fellows would like to stay longer, I can find my way home all right."

"Beckford and I still have some papers to go through before Court opens tomorrow morning," Ducasse said, "so we'll come along part of the way."

"Oh, yes . . . How did you get on in San José?"

"First rate. My Chinaman isn't even a member of the tong that did the shooting."

"It will be a clear acquittal," Beckford added. "But there's a lot of red tape to be untied before we can move. Well, Palgrave, we're with you. Step lively."

"We might as well go too," Culman said, rising. "I have a lot to do."

"You?" Beckford laughed. "Why, you're a gentleman of leisure."

"And a mechanical engineer," Culman added. "I have a sudden longing to tackle my old profession for a day or two."

"Another invention?"

"Yes. And it will be something better than a new churn drill."

"Perpetual motion?" Beckford mocked. He did not believe in Culman's sudden access of kinetic energy.

"Perpetual motion? Bah, perpetual bosh-wheels; I get my invention and nobody ever works any more except just to keep his appetite sharper than crab legs."

"YOU'RE all crazy," Beckford remarked dispassionately, as we bowed ourselves past the head-waiter. Thanks to Sylvester's tip he seemed heartbroken at our leaving so early.

"What's yours?" Beckford asked Sylvester when at last we found ourselves on the sidewalk.

"My what?"

"Pet brand of lunacy. All the others except good old John Petrie here seem to have eaten milkweed with their salad. Look at Colonel Dill—glum as the devil, and he usually so jovial after dinner. And here's Chemical Smith looking as if he had just come from his best girl's funeral. Now, Sylvester, what's your insanity?"

"Mine is in the same class as Culman's," he replied good-humoredly. "And by the way, you can help me to cure it. You know everybody in San Francisco. Could you get me into the library at the Mechanics' Institute tonight?"

Beckford stared. "Are your serious?" he asked.

"Perfectly. This is no joke. I've just had a fine idea for an investigation in atomic physics, and would like to look up a recent paper of Rutherford's on the same general subject. It's in the 'Phil. Mag.' or the Transactions of the Royal Society, and both of these are taken at the Institute Library. Of course, if there's no way of getting in on a Sunday night, I can go over to Berkeley tomorrow, and find what I want at the University. But I would give a good deal to strike the idea hard while it's hottest."

With a shrug of the shoulders Beckford accepted the situation.

"If it's as urgent as all that I can get you in. I know the librarian very well. Wait; I'll call him from here."

He dived into a saloon. We waited outside until he reappeared, ignoring the Colonel's pointed glances at the gorgeous cut glass panels of the swinging doors.

John, seeming to feel himself in the way, although he was not, invented a polite fiction that he had to visit a sick brother 'Eagle,' and left us. All through the dinner he had spoken but once, and that was to remark that there might be more in astrology than even he had imagined. We tried to detain him, but he was courteously obdurate, and departed about his own unobstrusive business.

"It's all right," Beckford said, rejoining us. "He has telephoned the night watchman to let you in. You can stay till morning if you will please turn out the lights before leaving."

Falling into couples we made our way toward Market Street. In the choosing of partners for the walk there was one singular exception to the general haphazardness of the choice. Palgrave found himself at first with Dill. After a step or two, he lengthened his stride and walked along with Beckford. Savadan fell into Palgrave's vacant place, but quickly changed it to walk with Sylvester. Herron, Ducasse and Culman, after similar false steps, walked on together. I was stranded with the Colonel; and for very humanity's sake had to keep step, as if he had been civilized, with the crafty general whose tower had accidentally stood higher than all of the others.

I am not more of a Pharisee than the average man, I trust, yet to save my life I could not have spoken a decent word to the old warrior beside me. He relieved me of the humane duty.

"Smith," he puffed, "you're a chemist. I'm not. The sciences were neglected at Harvard in my day. There was one notorious chemist there before my time. They discharged him for burning up his mortgagor's bones in the laboratory furnace. So chemistry was rather unpopular while I was a student."

Obliged to make some reply, I asked whether he regretted not having studied the science.

"Greatly, sah, greatly. A little of that dangerous knowledge now might make me the first military genius of the age."

"But there are no wars of any importance now. What were you thinking of? A new explosive?"

"You are right, sah. There are no wars in these soft times like the one in which I had the honah of serving my flag. We have grown flabby, sah, flabby. But watch Europe! Before you are past the military age there will be a show worth the seeing."

His thick, gloating words nauseated me. I knew him for a physical and moral coward clear through to his yellow backbone. Yet, for the sake of the proprieties, I swallowed my disgust and asked him what improvement he had in mind for the "art" of war. He countered with another question.

"What happens," he asked, "when a strong electric discharge takes place in ordinary air?"

"Why, some of the oxygen molecules break down, and the loose atoms reunite to form ozone."

"The gas which they find in the air at seaside resorts, and which is always advertised as such a fine, bracing tonic?"

"Yes. Only the fellows who concoct the 'ads' would make a better job of it if they left out the ozone. For ozone is a deadly poison—a very low per cent of the stuff mixed with air is absolutely fatal to human life."

Suddenly a thought flashed across my mind. I seized him roughly by the arm. For the moment I lost control of myself. Only his age saved him from a beating that would have sent him to the hospital for a year.

"You old devil," I said, "were those infernal towers of yours fitted up with some sort of super-dynamo for generating artificial lightning?"

"Our present electrical devices," he answered thickly, "are primitive and barbarous by those which that people had on the Desert—before it became a desert. They could send a sheet of electric flame clear across the last green island of fertility, from one tower to its opposite."

HE SPOKE as if he were in some pleasant dream. I shook him loose. After all, our electrical science is a thousand years from that high pitch of perfection; and Dill would be rotten centuries before his hellish improvement could be made practicable. So what did it matter? He began muttering again.

"Ozone is not the only poisonous gas. There are others. Why not use one of them?"

"Because," I shouted, hot with anger, "it would be a trick fit only for swine. We are still human beings, even if we do herd together in packs and tear each other to pieces like wild beasts. When we get to your kind of warfare, it will be time to wipe out the race and begin again."

"They nearly got to it once," he muttered, regarding me with dulled eyes.

"When?"

"At the seige of Sebastopol. It was at the most critical stage of the Crimean war. You won't find it in the histories. But I know. I have had exceptional opportunities for historical research—recently. The British War Office suppressed it. The scheme is still lying buried somewhere in their archives. They were soft, like you.

Not a real soldier in the whole lot of them."

"What did they suppress?"

"Dundonald's secret. He guaranteed to reduce the strongest fortification on earth within ten hours. And he proposed to use chemical gases to wipe out the defenders."

"The British suppressed it, you say?"

"Yes. They were squeamish about what you would call its inhumanity."

"Then there still is some hope left for us. Even all professional soldiers are not like you. Do you plan to suggest this weapon again?"

"Why not? The object of all military operations is to destroy the enemy. So why not do it as quickly as possible?"

"If ever you make this suggestion of yours public, or communicate it to another living being, I shall kill you."

He saw that I meant what I said. His face grew yellow and flabby with fear. This contemptible old coward who talked so glibly of annihilating thousands, shook like a jelly at the thought of his own death.

"Come and have a drink, Smith," he blabbered, laying one soft, white hand on my arm.

"Go to Hell!"

With that I left him. Beckford and Ducasse, anxious to get to work, had just caught a Powell Street car for the former's lodgings. The rest of the party evidently were waiting for me.

"What's happened to the Colonel?" Culman asked with a satisfied grin.

"He went to buy himself a drink."

Culman shot me a glance of complete understanding. "It's a good thing you shook him before some of us started a public row. Does he remember?"

"Yes, everything. Damn him!"

"Then somebody should do to him as they do to rabid dogs."

"That is precisely why he is taking a drink—to brace himself for the ordeal."

"So you had it out with him?"

"Clear to the end. He will keep what he knows under his own hat."

"Then that's one job out of the way. I have another. Will you all come up to my place for a few moments? Sylvester, you have all night for your studies at the library, and I'll not need more than an hour of your time. I would have asked you before," he went on apologetically, "only I did not care to have Beckford overhearing our plans."

Rather mystified—although we had an inkling of Culman's intention—we boarded a California Street car. Getting off at Stockton Street, we walked the half block up the hill to Culman's rooms.

"You live in a good neighborhood, Culman," Herron remarked ironically, nodding backward toward the once infamous Dupont Street.

"Very," Culman responded unsuspiciously. "Two churches—Episcopal and Catholic—in one block."

"Vice and virtue rubbing shoulders," Palgrave murmured. "I often wonder which it is that first attracts the other."

"The cribs were there first," Culman remarked innocently. He opened the door and we made our way up to his roomy apartment, with its magic night view of the moving lights on the Bay and Mount Tamalpais a crag of shadowy azure in the starlight. Again the unreality of it all surged over me, and my remembrance of Eos sharpened. Culman lit the gas.

"Make yourself at home," he said, "while I get things ready. There are cigars on the mantelpiece."

CHAPTER XX

The Sealed Cylinder

IT WAS always a treat to explore Culman's quarters. From floor to ceiling bookshelves lined the walls, bulging with their rich store of journals and rare pamphlets on psychic research. Under the broad, low windows roomy glass-doored cabinets held the disused implements of his old profession and a small working model of his money making patent. Culman referred to this part of his domain as "the museum." It's shining nickel triangles and T-squares, although they made a brave show, hardly balanced the vast array of psychic literature; and it needed no Sherlock Holmes to deduce that Culman's mind had always turned to the freedom of another existence rather than to the dead, mechanical facts of this shadow life. Nevertheless he still claimed on occasion to be a mechanical engineer, asserting that only his profitable invention kept him from astonishing the world with something much more ingenious.

While we examined his books, he seated himself at his work table and wrote rapidly for an hour. Finishing, he carefully rolled up his manuscript, drew a key from his pocket, and walked over to his "museum" under the windows. Having unlocked it, he selected a plain brass cylinder, fitted with screw caps at both ends through each of which had been drilled a small air hole. It was an ideal receptacle for a document of value.

"You probably guess what this is," he said, holding up his manuscript. "I propose to put it in this cylinder and seal it in the presence of you all."

There was an unusual solemnity in his voice and manner. For some seconds he gazed silently out of the window at the fairyland of the Bay and the dim, ghostly San Marino hills beyond. Then for a moment his eyes rested on the tower of Grace Church, just appearing, from its lower station down the hill, above the intervening roofs.

"Is it the record," I asked, "of what you saw on the time stream when Cheryl asked you to make your experiment?"

"Only the broad outlines. It would take a year to put down all that I saw. But this will be sufficient."

"Is it your will, Culman?" Herron asked with a rather sorry attempt at levity.

Culman's eyes again dwelt lovingly on the beauty of the perfect night, resting once more for an instant on the tower of Grace Church.

"It is not mine," he said, with unexpected solemnity. "No; the shadows in this fold of time some day will call it God's will."

There was an uncomfortable silence. Few young men relish intimacies of this sort, even with their elders; and somehow we felt that our sane mentor, Culman, had been guilty of bad taste, or at least of a slight indelicacy. He scarcely lessened our discomfort by adding in low tones:

"For He only knows the future; it is in His hands."

"What is your idea?" Palgrave asked, hastily changing the subject.

"It is hard to say exactly. I have a feeling that before long we shall be exiled from Eos, and again be forced to spend almost a generation—of their reckoning here—in this shadow existence. We may have to remain in this dream life so long that we shall finally come to doubt the existence of Eos. That, of course, would be almost fatal to our chances of finding our way back in the time stream."

"Undoubtedly," Savadan agreed.

"So I have written on this roll the main points of what I saw when I made my experiment. That vision was an accurate, detailed picture of the near future of this region of the shadow life where we in this part of the stream now are. Within ten years at the very most the events recorded on this roll will come to pass. They may begin tomorrow, or next week, or a year from now; my sense of time was rather numbed by what I saw, so I cannot set a definite date for the beginning. But I am reasonably confident that ten years will be a sufficient period for the transpiration of at least part of what I have recorded—or prophesied, as the shadows here would put it in their ignorance of the nature of time.

"Now, as these things which I have described vitally concern all of us, I thought that perhaps their strict verification in the near future would serve to convince us again that Eos is the real life and this the shadow. For it was from Eos that I plunged into the time stream and foresaw everything recorded on this paper."

"I SEE," Sylvester nodded. "Once we recover our conviction—if we should ever lose it—that this life is like an unreal vapor, it will impel us to return to Eos. It sounds reasonable enough. It certainly is amazing how completely most of us forgot Eos on the first of our plunges. When Ducasse sent us back from the Chamber of the Serpent, we lost ourselves hopelessly for almost half of one of their short generations in this life of shadows. Dill, I am sure, remembered nothing of Eos until yesterday. He seems to have passed directly from his war in the Beast State to another in the shadow life, vivider even than the Beast war, which for long obliterated all impressions of his real inhumanity."

"That is exactly my idea," Culman assented. He unscrewed one cap of the cylinder and inserted the roll. "Now to seal it beyond all danger of fraud."

He regarded the brass cylinder with an air of whimsical affection. "This was to have been the lung of a cold air engine destined to revolutionize the automobile industry. But my darling died abornin'. It never drew a breath."

He rummaged among his tools, finally producing a piece of fine steel wire, a small lump of lead, a pair of pliers and a die-stamp. Threading the wire through the hole in the bottom cap, he passed it up through the cylinder and through the hole in the free cap, which he screwed home, leaving the wire projecting from both ends of the cylinder. With the pliers he twisted the free ends of the wire together; and after heating the lump of lead in the gas flame, sealed it over the junction in the usual way.

"Will somebody make a distinctive mark on that seal?" he asked; "one that could not be mistaken?"

Sylvester opened his penknife and cut two queer mathematical symbols deeply into the soft lead.

"That ought to fix it," he remarked. "And I'll cut the date, 15 April, 1906, on the other side."

"Now, where shall we keep it?"

"Let me put it in my safe-deposit drawer at the Crocker Woolworth," Palgrave suggested. "It's class A fireproof."

"The first thing tomorrow morning?"

"Yes. Say at nine o'clock sharp. Then Smith can stop there as a witness on his way to his laboratory."

"We had better agree now on a date for unsealing it," Herron suggested.

"Of course," Culman agreed. "What do you say if we make it the fourteenth of April, since it was on that date that we first got our bearings here and found our way back to Eos?"

"What year?" Savadan asked.

"That's a question. This record, if right, should be verified, at least partially, within ten years. If my guess is correct that will make it 1916. What do you say?"

"To put it beyond all doubt, let us give it a little longer."

"How much, then?"

"Say till 1931. That is easy to remember, exactly a quarter of a century."

"All right," Culman agreed. "If nobody objects we pledge ourselves to meet in twenty-five years lacking one day, from now, to unseal this cylinder."

"On the fourteenth of April, 1931, then?" Herron asked.

"Yes. Don't forget. And if any of us are dead—in this life, that is to say—by that time, the others promise to read the manuscript."

We nodded, and prepared to depart.

"I can guess what you're up to, tonight, Sylvester," Culman laughed. "You are planning to bring these hungry, labor-ridden wretches the secret of the undying fire. Well, I'm with you. That is exactly what I mean to try. I shall play seriously with these old tools again for the first time in fifteen years."

"Do you recall any details of how they work the transformation in Eos?" Herron asked.

"Not one," they answered together.

"I WONDER if Beckford could make good his brag before the Council," Savadan said with a smile. "He denied the possibility of an intelligent mind existing without this 'intuitive' knowledge of nature's 'simplest' secret."

"Perhaps Beckford's legal training has obscured his intellect," Herron suggested maliciously. Being forced by his profession to listen to their impassioned oratory, Bill had rather a distaste for lawyers.

"But I have a clue," Sylvester continued. "The starting point of the transmutation of matter into energy is in the recent work—in this shadow life—on radioactivity. That is all I remember, and it is an age from the ultimate solution."

"And I not much more," Culman added forlornly. "The long swim down all the ages between us and Eos seems to have washed our minds clean of our inherited natural knowledge. We are different beings from what we are in Eos. What wouldn't I give for one look this instant at the great central ball of the Undying Fire! I shall have to begin with the first gropings toward science of the primitive ignorance of this existence."

"If only we might bring them a shadow of our own

Golden Age," Sylvester sighed, "I should not regret my exile. Poor wretches! They slave all their lives to keep life in their crooked, toil-racked bodies, while all about them seethe the inexhaustible fountains of plenty and happiness."

"Yes," Culman agreed, "they have grown so inured to hunger and brute labor that they look upon these evils as a just curse richly earned by their poor sins. But the science we shall leave them will change all that."

At nine o'clock I met Palgrave at the Bank, and we deposited the brass cylinder in his drawer. Both having much to do, we separated at the Bank, he to keep an early appointment at his office, and I to go to my laboratory.

My work for the week, I remember, was the analysis of several samples of tomato catsup, supposed adulterated, sent me by the Pacific Groceries Company. How absurd and trivial it all seemed! Here was I, wasting my time and energy in the detection of a petty fraud, while Eos, for all I knew, was even now hastening to its ruin. All my attempts during the night to find my way back in the time stream had proved futile.

My efforts to reproduce the clicking sound of the ball had failed signally. It was not a sound to be imitated by design. With a sharp sense of irritation at my helplessness I realized now that in the snapping of the dry twig down by the five pillars in Cheryl's garden, and in the clicking of the charred match, there had been some illusive, accidental quality of sound which I could not recover.

By eleven o'clock I was engrossed in the technique of my chemical analysis to the exclusion of all else. A few minutes before twelve, Herron burst in upon me, excitedly waving a copy of the *Star*. His clothes were torn, and one blacked eye was almost closed.

"Where did you get it, Bill?" I laughed. The idea of Bill Herron with a black eye was an amusing novelty. Our crowd believed him invincible against anything within ten pounds of his own weight.

"Never mind me just yet," he said, shoving the *Star* in front of me. I glanced up and saw that he was deadly serious.

"Beckford and Sylvester have gone back without us. Read that."

I glanced over the sensational headline and down the half column of display type. A well-dressed young man, later identified by a reporter on the *Examiner* as Joseph J. Sylvester of Los Gatos, had been found unconscious by the janitor in the reading room at the Mechanics' Institute. It was apparently a case of suspended animation. Later, Edward C. Beckford, the prominent young attorney, had been discovered in a similar condition in his bed. On Beckford's failure to keep an important engagement with his friend Mr. Ducasse, the latter had gone at once to his rooms to investigate.

Both men were now lying at the Emergency Hospital. Their condition baffled the attendant physicians, it clearly not being an ordinary trance or coma. But for the temperature of their bodies both men might have passed for dead.

We had better get them to a more suitable place than the hospital," Herron suggested.

I flung off my rubber apron and reached for my coat and hat.

CHAPTER XXI

The Malady Strikes!

"GET Palgrave on the telephone, will you, while I put things straight?"

Herron made the connection almost at once.

"Dr. Palgrave?" he asked, and stood listening, his expression rapidly changing to one of alarm. Over the wire I heard a girl's scared voice begging him to come at once to Palgrave's office and to bring a doctor.

"All right," he said, hanging up. "It's his office girl. Palgrave has gone back too. Fell down unconscious less than a minute ago. Come on."

"Wait. Find out first what has happened to the others. Palgrave is in no danger."

The landlord reporting that Culman's door was locked, I asked him to use his pass-key, and held the wire. In half a minute he was back with the message that Culman was sitting unconscious, but still alive, at his work-table. I asked him to lay Culman flat on his back on the floor, put a blanket over him, and do nothing further until one of us came with a physician.

"Why didn't Ducasse telephone one of us?" Herron asked.

"That's what is puzzling me. Do you suppose he has gone back too?"

"No," he replied. "Otherwise the papers would surely have got hold of his trance. For his movements would certainly be followed by any live reporter."

Just then the telephone rang. Taking down the receiver, I heard Ducasse speaking.

"Keep cool, Smith," he said. "There is nothing to be panicky about. Dill has gone back too. Savadan is still here. I telephoned over to Belvedere, and found out that Cheryl passed a very restless night. On getting up this morning she told the maid that she had been troubled by bad dreams, which she could not recall. After breakfast she felt unwell, and lay down. At present she is sleeping soundly. This means that she, Dill, and Beckford have gone back to Eos. We are stranded."

"Sylvester went back too, so also have Culman and Palgrave—the last not more than five minutes ago. So perhaps our side is in no immediate danger." I told him briefly the results of our inquiries, and asked his plans.

"Beckford's father is coming over from San Rafael to take care of him. So he's off our hands. Dill is being looked after by his landlady and a good doctor who knows nothing of the case. The rest of us must all get together and go back in a body, so that we can stop whatever Dill and Beckford are doing. For I feel sure they are up to no good.

"Do you realize that they have been in Eos almost a quarter of a generation if our relative time scales are still the same as they were yesterday? Culman and Sylvester are in Eos now; so perhaps, as you say, the need for us is not urgent. But it may be before long; and we must lose no chance of getting back before the crisis. I'm afraid Culman will do something rash without Savadan to restrain him."

"What do you plan?"

"Leave Dill and Beckford where they are, to be taken care of by their friends. They are safe, and we want neither with us in the time stream. Take Palgrave and

Sylvester to Culman's rooms. Savandan and I will meet you there with Herron, and we shall try to find our way back together. Keep everything further out of the papers if possible. I have an auto ready to take Sylvester. The hospital people understand that they can do nothing, and are willing to turn him over to me under a physician's care. We can easily shunt the physician—I'll do it on the way to Culman's. You get Palgrave."

"All right." I rang up Palgrave's negro chauffeur and told him to be at his master's office with the car inside of ten minutes. Then Herron and I hurried away to get there first.

"How did you achieve your black eye?"

"Doing the Sir Galahad, knightly rescue act to a damsel in distress."

"Why, what and how?"

"Trying to punch the jaw of that fresh sub-editor who called Cheryl a 'cocktail-drinking dearie' or something of the sort. The fellow looks like a dead codfish, but he knows how to use his mitts. Just the same I handed him a good one."

The incongruity of it all appealed to my sense of humor. Here we were, hurrying to what perhaps was the last act of a cosmic drama in which Cheryl was the heroine, and one of us had earned a black eye for resenting an insult to Cheryl's shadow in the unreal reflection of a future existence. I laughed till the tears came.

"SHUT up!" Bill growled, as we turned into Palgrave's office building; "or I'll paste you one on the jaw. You're easy meat any way, even if the other fellow wasn't."

"It isn't that," I said. We were in the elevator. "To think of two irate shadows brawling over a dream within a dream—for that accurately describes Cheryl's vision of San Francisco in ruins—while the real world may be going to pieces ages behind us, is certainly enough to make anyone laugh. Sorry for your poor eye, Bill, but I can't help it."

We found Palgrave stretched out on the lounge in his inner office. His eyes were wide open, but he was in a trance. The office girl withdrew, closing the door after her.

"Sometimes a man in that state can walk automatically," Herron said. "Let us try him."

We got him to his feet, put his arms upon our shoulders, and started to walk slowly. He stumbled along between us.

"It works. Let us take him down at once. His car must have come by now."

Disregarding the protests of the scared office girl, we walked him to the elevator and got him safely into the car. Within ten minutes he was in Culman's sitting room. Ducasse and Savadan were already there. Sylvester lay beside Culman, the same warm blanket covering both. We laid Palgrave alongside of them, and put an extra blanket over all three. Then we four sat down to watch.

(To be Continued)

NEW PLANETS TO DISCOVER

FOR thousands of years, mankind got along with the "seven planets" which were visible to the naked eye (the Sun and the Moon were included in the count). Then Uranus, the Asteroids, Neptune and Pluto successively swam into the fields of the great telescopes.

Now a great American astronomer has told us where to look for another, larger and more distant than any of the other telescopic planets—one exceeded in magnitude only by Jupiter and Saturn—following its leisurely course out in a void where the sun is only a larger star. Planet "P," forty thousand miles across, but five billion or more miles away, will tax the resolving powers of the greatest telescopes of the southern hemisphere; and will not rise above our northern horizons for hundreds of years.

But "P" is not the last straggler of the solar system; Professor Pickering finds indications of *two others,* and it is not impossible that there are planets so far in outer darkness that they will never be seen from our earth.

Read about the manner in which the detectives of the skies ferret out strange planets from their hiding places—see Paul's marvelous drawings—

IN THE BIG JANUARY ISSUE OF

EVERYDAY SCIENCE AND MECHANICS

Do You Want Science Fiction Movies?

We address this question to all lovers of science fiction.

Motion picture companies are asking this question, too. But despite the success of science fiction in this country, and the rapidly growing reading public, the number of science fiction movies that have appeared in America have been pitifully few.

"Metropolis" and "By Rocket To The Moon" were German films; only "Just Imagine" which was after all a humorous rather than a realistic film, "The Mysterious Island" and one or two others have been filmed in America.

Now comes news that Universal is filming "Frankenstein," and "the Invisible Man" of H. G. Wells; and that R-K-O has a film resembling the "Mysterious Island." But these few films are mere crumbs thrown to the hungry lover of science fiction. And even the millions who do not read science fiction, who are lovers of adventure, and exploration in new places and times, are becoming tired of the monotony of sex, gangster and war pictures.

Do You want Science Fiction Movies?

If you do, you have but to make yourself heard. Many of our readers are writing to film companies to make their desires known. BUT THAT IS NOT ENOUGH! Film companies are guided by the wishes of thousands and tens of thousands, not by a few letters here and there.

Wonder Stories Will Make Your Demands Count

We are organizing a gigantic petition signed by all those who want science fiction movies and will present this petition to the large motion picture companies. IT IS UP TO YOU as lovers of science fiction to make this a success.

Get Five Signatures to This Petition

and return them to us at once. We will gather them together and *show the motion picture companies the enormous demand for science fiction movies.*

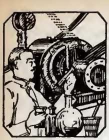
Sign this petition yourself, get four other signatures of your friends and relatives and return them to us. We will do the rest!

If you wish additional petition blanks write to us for them immediately.

EDITOR, WONDER STORIES,
98 Park Place,
New York.

We the undersigned, herewith add our voices to the great demand of lovers of science fiction, for the production of a reasonable number of Science Fiction Movies in America. If such pictures are produced, we will support them loyally and urge our friends to do likewise.

(Name—Please write plainly)	(Address)
(Name)	(Address)
(Name)	(Address)
(Name)	(Address)
(Name)	(Address)



Science Questions and Answers

This department is conducted for the benefit of readers who have pertinent queries on modern scientific facts. As space is limited we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical also, to print answers as soon as we receive questions. However, questions of general interest will receive careful attention.

Suspended Animation

Editor Science Questions and Answers:

1. Has suspended animation ever been produced, and if so how?

2. Has artificial blood ever been produced, and if so how?

3. What is the Fitzgerald Contraction? Is there any truth in it?

Robert J. Wayne,
17515 Wildemere Ave.,
Detroit, Mich.

(1. Suspended animation occurs in many forms of life; though it is at times hard to distinguish the condition definitely. Some forms of vitality activity may be temporarily suspended—such, for instance, as breathing, or the beating of the heart—without causing death; but the cells of the body must remain alive and in a certain state of activity. Some cases of suspended animation, ranging up to a period of many days, in human beings, have been recorded on apparently good medical authority.

2. Blood is an extremely complicated fluid, containing living organisms, which have not been created artificially.

3. As to the Fitzgerald Contraction, it is a theory deemed useful in dealing with certain mathematical work. In its very nature it does not lend itself to verification in a terrestrial laboratory. It is based, like certain expressions of the theory of relativity, on the fact that, where all observations must be made by the aid of light, the speed of light must enter into all our calculations. The equation is as follows:

$$L=\sqrt{1-\left(\frac{v}{V}\right)^2}$$

where L is the length of the object in the direction of motion, (as compared with the same dimension when at rest), V is the velocity of light, and v is the velocity of the object in a given direction. The result is, in plain English, that any object becomes shorter in the direction in which it is moving but, until the velocity gets up into thousands of miles a second, the difference would be extremely small. Furthermore, since any measuring rod would also shrink when turned into the line of motion, no means of measuring the Fitzgerald Contraction by such a practical method can exist. It is, however, a useful assumption for astronomers in correcting their observations, and for other purposes of pure science.—*Editor*)

The Center of the Universe

Editor Science Questions and Answers:

My friend and I had an argument and I would appreciate it very much if you would answer the following questions.

1. Is our sun the center of the universe and if not is there a center?

2. Are there other systems with a sun and planets like ours?

3. Where do the stars get their light?

I remember reading where somebody advanced the theory that our solar system and others like it revolved around a center. And I think I confused it in my explanation.

Will you please explain it?

E. Schovanez,
2432a McNair Ave.,
St. Louis, Mo.

(1. We are not sure what our correspondent means by "the universe." If he means the whole cosmos, everything, the answer is that we do not know, but that it is extremely improbable that our sun is near its center. If, however, he means by the word universe, the collections of suns and stars that are called "The Milky Way," the answer is that our sun is not far from its center. By the term "not far" is meant some 20,000 light years, or about 120,000,000,000,000,000 miles.

Now it is known that all the suns of the system we call the Milky Way revolve about a center of gravity, just as our planets revolve about the sun. It is believed that even such systems of suns as our Milky Way are united in greater systems and these too revolve about a common center. And finally it is believed by some that all matter in the universe moves about its common center.

2. We have never been able to bring any other suns so close to us by telescope to tell whether any possess planets. But it would be extremely foolish of us to assume that of the billions of suns strewn through the cosmos that ours alone possessed satellites. The formation of planets, by the tearing away of chunks of our sun by the gravitational pull of another sun that came close, could happen at any time, in any part of the cosmos. And it has probably happened millions of times.

3. What we call the light of the stars is only the emanation from them of radiant energy that strikes our eyes with a sensation of light. If a filament of wire is heated it becomes what we call incandescent and gives off light. The stars similarly are gigantic, incandescent suns, radiating light in all directions. The actual energy of the suns that enables them to keep radiating for millions upon millions of years is probably obtained from the destruction of matter and the release of atomic energy in the interior of the suns.—*Editor*)

Changes in Gravitation

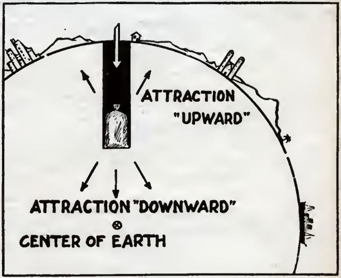
Editor Science Questions and Answers:

Is there any appreciable difference in the force of gravitation at sea level and above and in the depths of the earth? Have any tests been made to determine this?

Franklin L. Morgan,
1340 S. Walnut Way,
Whittier, Cal.

(The force of gravitation, by definition, depends upon the mass of the body whose gravitation (by the earth) is to be considered, and depends upon the distance between the centers of gravity of the two bodies. The gravitational force, in fact, decreases with the square of the distance between the centers of gravity of the two bodies. Thus, on the exterior surface of a body, the gravitation is greatest, because the pull of the earth is all on the same side of the body, and the body is as close to the center of the earth as it can come.

Now ordinary weight, or gravitation, is measured at sea level, for the level of the sea is considered, for all practical purposes, as the surface of the earth. Now if we ascend a mountain, our distance from the center of the earth has been increased, but there is more mass (the mass of the mountain) between us and the center. Since gravitation increases only as the first power of the mass, and decreases as the square of the distance, it is evident that the weight of a person on top of a mountain would probably be less than at sea level. Three miles above sea level one pound would weigh only 0.99922 pound, and a 150-pound man will lose in weight 0.12 pound.



Showing how the weight of a body below the earth's surface would diminish, because part of the earth's mass exerts an upward pull, which counteracts in part the downward attraction.

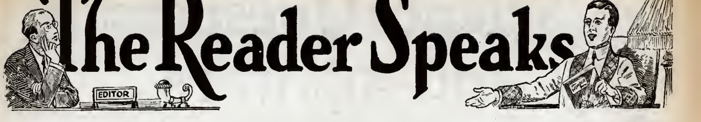
If our man were below the sea level of the earth, but still on its surface, such as in the great expanse of the Dead Sea or Death Valley, his weight would be increased, for his distance from the center of the earth would be decreased. If, however, he went *into* the earth, his weight would probably decrease, for a goodly part of the earth's mass, above him, would exert a pull on him opposed to that exerted by the mass under him. And if he reached the center of the earth, where the pull on him would be equal in every direction he would weigh nothing.

Because the earth is flattened at the poles, a person would weigh more there than at the equator where he is farthest from the center of the earth.

The whole problem is a mathematical one, and depends solely upon the distribution of the masses of the earth about the man, and his distance from its center.

We have no names or dates of tests of the change in earth's gravitation at various

(Continued on page 1000)



The Reader Speaks

IN this department we shall publish every month your opinions. After all, this is your magazine and it is edited for you. If we fall down on the choice of our stories, or if the editorial board slips up occasionally, it is up to you to voice your opinion. It makes no difference whether your letter is complimentary, critical, or whether it contains a good old-fashioned brick bat. All are equally welcome. All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large influx of mail, no communications to this department are answered individually unless 25c in stamps, to cover time and postage is remitted.

Which Is Most Important, Readers?

Editor WONDER STORIES:

I think WONDER STORIES is about the best all around science fiction magazine being published. It prints readable stories and gives more of a scientific basis for what happens. It doesn't go in for "pure action" like another magazine of science fiction. I dont mind logical action, if woven with some degree of art but that kind of action that I've read in another magazine that is mostly a rehash from month to month—excuse me!

I like my stories original, with a difference to them. That's why I like Clark Ashton Smith's "Beyond the Singing Flame" and some of Repp's stories. Some time ago I read a story in which the author had his character go through all the processes of evolution from his present state to simple protoplasm, under the influence of cosmic rays. That yarn was a gem.

In the last issue "Beyond the Singing Flame" and "The Superman of Dr. Jukes" were the outstanding stories. I think that the 'Superman" story was the best for it wove action and good writing, and a thread of social philosophy into a wonderful yarn. On the whole Flagg seems to be your best writer. Can't you give us more stories by him than you do?

The new format is an improvement over the smaller one, both as to looks and quality of paper. Keep up the good work.

C. Harry Jaeger,
2900 Jordan Road,
Oakland, Cal.

(Mr. Jaeger opens up a question that has long puzzled the editors. We get a variety of letters from readers telling us the stories that they like best. Now we would like to know the *kind* of stories, you like best. In other words what is most important to you in a story. 1 fast action, 2 a good plot, 3 an unique scientific idea, 4 a description of some strange place with plenty of local color, 5 a story with a moral or a lesson? We would like very much to know in what order our readers place these qualities in a story. Which is most important, which is next important and so on? We want to hear from every reader who has definite ideas, and even from those who haven't.—*Editor.)*

Life Without Protoplasm Is Impossible

Editor WONDER STORIES:

I have just received the new issue of our magazine. Congratulations! I like the larger size, but the best thing you did was to give us the good paper. Now WONDER STORIES is a real magazine again.

Your feature story, "Tetrahedra From Space" by P. Schuyler Miller was very good—one of the finest science fiction stories I have ever read. But I regret, I must say, that the great laws of the science of life were not to be found in the story. Chemistry teaches us that another structure of a living body, than the protoplasmic, is impossible. There is an old tale of the possibility of a living world in the form of a "silicon world." (Our own world is a carbon world.) It is the tale that it must be possible to bring all of the millions of organic stuffs into a form so that the chemical formula will always show the character Si which stands for Silicon instead of C which the chemists use to designate Carbon.

For instance the gas methane (in German it is called Sumpfgas or swamp gas) has the formula $\mathrm{CH4}$; in the silicon world it would be $\mathrm{SiH4}$. It is true that German scientists have worked with success on the possibility of a Silicon world and it was possible to make such compositions as $\mathrm{SiH4}$. Not only this but they made a Silicon-chloroform.

But these successful experiments have also shown that a silicon world possible as it is, can never be a living world because silicon is not really the double of carbon. Or, Si is *only* a double but not the same.

It is believed that Si is not able to make the characteristic chains of C and it is true that Si has an affinity to Oxygen. It is also to be remembered that the products of organic life would be very different. The most frequently produced thing of organisms is $\mathrm{CO2}$, a gas. But $\mathrm{SiO2}$ is sand! How would it be possible for nature to build living things producing sand.

These are a few of the reasons that have brought science to say that life without protoplasm—the real protoplasm of our real carbon world—is impossible. Life without protoplasm cannot exist; and if there is life anywhere it must be built of protoplasm.

But except for this, "Tetrahedra From Space" is a fine story.

Willy Ley,
Berlin,
Germany.

(Herr Ley brings some excellent arguments to prove that life without protoplasm is impossible. Some of his arguments the editors agree with, and to others we take exception. But instead of answering Herr Ley ourselves on this interesting and important subject we will have P. Schuyler Miller, author of "Tetrahedra From Space," write an answer to be published in the next issue of WONDER STORIES. But we are very glad to hear from Herr Ley.—*Editor.)*

Thought He Would Take a Chance

Editor WONDER STORIES:

Although a few thousand miles separate us, I am taking the liberty of writing you about your publications.

I have always been interested in Science and the lure of the unknown and the possibilties of the future appeal to me more than anything else. Many years ago I had devoured the works of Jules Verne and H. G. Wells and since then I have been on the lookout for someone to take their place.

A few months ago I was passing down a street in Edinburgh, which is about twenty miles away, when I saw, lying on a shelf along with a number of other second-hand magazines, a brightly coloured periodical which according to our conservative ideas we would call "gaudy." The picture on the cover depicted a marvelous and wonderful space flier, and as that theme always interests me I thought I would take a chance. The periodical was your WONDER STORIES magazine and I certainly have not repented my purchase. Since then I have been able to pick up one or two more of that publication and also a few of the "Air Wonder" series. I have enjoyed every one so far. The science is generally good and the style as good as that of most magazines but, as usual, I have a "brick-bat" to hand out.

ON LETTERS

BECAUSE of the large number of letters we receive, we find it physically impossible to print them all in full. May we request our correspondents, therefore, to make their letters as brief and to the point as they can; as this will aid in their selection for publication? Whenever possible, we will print the letter in full; but in some cases, when lack of space prohibits publishing the complete letter, we will give a resume of it in a single paragraph.

Why allow obvious impossibilities to creep into otherwise excellent stories? One case in particular struck me. I forget the name of the story but it dealt with a race of intelligent octopi living miles deep under the water. The people who visited them came out of the submarine in rubber suits (where the pressure of the water must have been tons to the square inch!) and yet the frontispiece of that story depicted them in the modern deep-sea suit made of steel which requires a crane to move it.

However I like your magazine.

Dr. W. A. Gibson,
14, Hopetoun St.,
Bathgate,
West Lothian,
Scotland,
British Isles.

(The old wags about Scotsmen never taking a chance doesn't seem to hold true in the case of Dr. Gibson. He took the plunge and drew out—well, take his own words for it.

With regard to the story Dr. Gibson refers to, we do not place it at all. We would be very glad to have it called to our attention, for future avoidance of such errors.

But, seriously, we are glad to welcome Dr. Gibson to our fold, adding another nation to the league of science fiction lovers.—*Editor.)*

Time is An Endless "Now"

Editor WONDER STORIES:

I have just read Mr. Kaletsky's letter in the November issue, asserting "There is no such thing as the present." In response to your invitation for opinions I wish to say that I fundamentally agree with Mr. Kaletsky.

What we term "the present" is only an infinitesimal portion of time—a time-point one may call it—the vanishing-point between "past" and "future." Strictly speaking, there is no distinction between "past" and "future" in the four-dimensional universe, for when we consider the time-continuum as a whole, the "past" and the "future" are co-existent; any distinction between them depends entirely upon the observer's location on the time-axis and the direction of his motion along it.

Suppose, for example, that we cut out a definite portion of the time-coordinate t, the ends of this line being marked by the points P and p. Midway between P and p we mark another point M—an *infinitesimal* portion of the time-line. Now we may imagine two observers O and S, one starting at P and moving toward p at a constant velocity c, the other starting at p and moving in the opposite direction along t toward P, also at the constant velocity c. At M the two observers meet, and the point-instant M then is "the present" for both O and S.

Now for O, who is moving, say, toward p, the time-interval MP is "the past" and Mp is "the future," while for S, who is moving the opposite way, Mp is "the past" while MP is "the future." For a hypothetical super-observer who is viewing this entire procedure from a distance

(Continued on page 1002)

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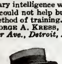
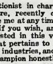


I am a Projectionist in charge at the Andelus theatre, recently completed. You may quote me at any time or place; refer to me, if you wish, anyone who may be interested in this vast virgin field of all that pertains to Radio and its many allied industries, and I shall be delighted to champion honestly without any reservation, your courses.
A. H. STRENO,
2005 Woodburn Ave., Cincinnati, Ohio.



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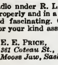
361 Coteau St., W.,
Moose Jaw, Sask., Canada.



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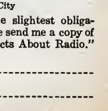
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SCIENCE QUESTIONS AND ANSWERS

(Continued from page 997)

places, but our recollection is that such tests have been made and have verified the above statements.

The centrifugal force of the earth also influences gravitation. The earth's rotation causes a centrifugal force on objects on its surface. This force which tends to throw objects away from its surface naturally reduces the gravitational force. The centrifugal force depends upon the speed of rotation. This speed is greatest at the equator, and least at the poles; and thus causes an additional variation between gravitation at the equator and at the poles. Furthermore the centrifugal force would be larger on a high mountain than at sea level, and this too would make one on a high mountain weigh less than at sea level.—*Editor*)

The Interior of the Earth

Editor Science Questions and Answers:

1. Would an object in space lose its heat quickly. I understand that objects do not radiate very much when cooler than a red heat. What do you think?

2. Is the interior of the earth a liquid or a solid?

3. Is Jupiter a gaseous or solid sphere?

Emerson Bewley,
R 4, Box 129,
Lodi, California.

READERS

If you like "Science Questions and Answers" in this magazine, you will find in our sister magazine,

EVERYDAY SCIENCE AND MECHANICS

a similar department, greatly expanded called "The Oracle." Look for it, you science fans!

(1. The rate of radiation of a body depends upon the fourth power of its absolute temperature and the fourth power of the temperature of the surrounding medium. It is obvious therefore, that a body which has twice the (absolute temperature) of another will radiate heat 16 times as fast.

In their "Exiles of the Moon" Messrs. Schachner and Zagat figured that a man in interstellar space radiating heat to emptiness (at absolute zero) would lose only 1/9 degree Fahrenheit per minute. Theoretically, therefore, a man could live without heat protection for at least 90 minutes in interstellar space. This is assuming that space is empty, and that heat is lost only by radiation. Our correspondent is correct in assuming that bodies below a red heat would lose heat by radiation slowly.

2. Since no one has yet penetrated far into the interior of the earth, nothing much is known of its interior constitution. We do know that materials are probably under tremendous pressure, and possibly tremendous heat, but the pressure serves to raise the melting point of the interior materials sufficiently to keep them solid. It is only when the pressure is suddenly removed, as in earthquakes, that the solid, highly heated rocks turn liquid, develop steam and make themselves known as volcanic eruptions. Except for this evidence we know nothing of what the inner core of the earth consists.

3. Jupiter is so completely covered with cloud layers that nothing has yet been discovered about its interior. But its apparent specific gravity is much less than that of the earth. That may mean that the planet is principally gas, or it may mean that what we observe is not the real surface but only the gaseous envelope. We must await further studies to determine anything about its real constitution.—*Editor*)

Why is Carbon Heavier?

Editor Science Questions and Answers:

Studying the list of atomic weights of elements printed in the "Questions and Answers Department" I notice that Carbon has an atomic weight of 12.005 and Oxygen has an atomic weight of 16.000. If oxygen has the heavier atoms, then why, oh why is oxygen a gas and carbon a solid?

Also has uranium ever been isolated, or has it just been detected in the spectrum? If it has been found what are some of its characteristics?

R. W. Gooch,
206 Judah St.,
San Francisco, Cal.

(Our correspondent is probably under a misapprehension regarding the qualities of the different states of matter, solids, liquids and gases. As a matter of fact, the state of a body has nothing at all to do with its weight. The state of the body is concerned only with the relative motion of the molecules. If the molecules are close together and relatively fixed in position, the shape of the body is "rigid" and the body is called a solid. If the molecules can move freely past one another, and the body therefore take the shape of the container into which it is poured, it is called a liquid. If, however, the molecules are possessed of quite rapid motion and its volume can be freely expanded and contracted, then it is a gas.

Now all that the atomic weight of the body refers to is the weight of individual atoms or molecules. One atom of oxygen weighs more than one atom of carbon. Now one might say, does one cubic foot of oxygen weigh more than one cubic foot of carbon? And the paradoxical answer would be, "under normal conditions, no, the carbon would weigh more." By the term "under normal conditions" would mean oxygen at room temperature and normal atmospheric pressure. The reason for this seemingly paradoxical state of affairs is that "under normal conditions" the number of molecules in a cubic foot of carbon exceeds vastly the number in a cubic foot of oxygen. And the reason is, because carbon is a solid and the molecules are packed very tightly together. Oxygen is a gas and they are not quite so numerous, but are in very rapid motion, having open spaces between molecules. If, however, oxygen could be compressed so much that it possessed the same number of molecules per cubic foot as carbon, then the oxygen would weigh 16/12 or 1.333 times as much as the carbon. But to compress the oxygen so much would probably cause it to liquefy so that it would no longer be a gas.

Uranium is a rare, heavy white metallic element. It is never found in its elemental form, and it has no important uses as an element. But certain of its compounds, notably the uranium salts are used as pigments, especially in the manufacture of glass and porcelain.

Uranium tends to break down to form other elements. The action is that of radioactivity, similar to that of radium. When an uranium atom breaks down, eight atoms of helium and one of lead are formed. The process of the breakdown of uranium to lead and helium is continuous, but extremely slow. It is estimated that of a given quantity of uranium, half of it will have changed to lead in 5,000 million years. Because the rate of breakdown of uranium is so unvarying, it has been used to measure the age of the earth.

Uranium has an atomic weight of 238.2. It melts at about 1600 degrees centigrade. It was discovered in 1789 and was isolated first in 1842. It occurs in the mineral pitchblende as an uranium salt. It was the examination of pitchblende by Madame Curie that led to the discovery of another radioactive salt that she called radium.—*Editor*.)

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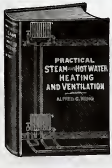

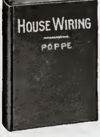

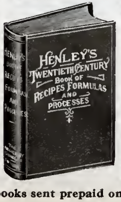

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THE READER SPEAKS

(Continued from page 998)

and who can see the entire time-line *t*, there is neither future nor past distinguished upon it, for both halves MP and Mp of the line are coexistent. I think this simple analogy shows quite clearly that the division of time into "past," "present," and "future" is purely arbitrary, and is made only because man's undeveloped mind is as yet unable to regard problems four-dimensionally.

Considering the time-axis as a whole, it is apparent that somewhere along that line the American Revolution is still being fought, somewhat further back Columbus is still braving the dangers of the unknown Atlantic, and still further back Attila's Huns are sweeping through Europe. Ahead of us on the time-dimension of the universe our children and our children's children are already working out the problems of their lives, even now they refer to the year 1931 as "the past."

Time is an endless "now" which includes all our artificial divisions termed "past," "present," and "future"—these distinctions have no actuality in the world of reality; they exist only in our minds.

Philosophic speculation on this subject is very intriguing, so lest I wander off into endless discussion I think it advisable to apply the brakes to my ramblings at this point, with a final word of congratulation to you anent WONDER STORIES' new garb. She's a wonderful magazine again—keep it that way.

Frank J. Bridge,
Rt. 1, Box 787,
Station D,
Milwaukee, Wis.

(The question of time and time travel is reaching a high peak of interest as evidenced by the letters of argument, on every possible phase of the subject that we receive. Mr. Bridge undoubtedly offers a new way of looking at time that should help to clarify many hazy ideas. His view is substantially that of John Taine, expressed in "The Time Stream." The coming generations should see many discoveries in experimental science tending to prove what men like Taine, Einstein, Minkowski and others have stated mathematically. How far we can go in such proofs of course, no one knows. For the ultimate proof would be time travel itself.—*Editor.)*

No Exaggeration

Editor WONDER STORIES:

Before me is the November issue of WONDER STORIES. Larger size, smooth edges, better paper, fine illustrations and great stories all grouped together to make the finest science fiction magazine ever printed! And that's no exaggeration.

The large size, smooth edges, and fine paper combine to improve the appearance of the book and are sure to give it greater prestige among magazines. It is far more dignified and it brings it high above the "pulps" in readers' estimations.

Just a word about the illustrations. They are excellent. I congratulate Mr. Paul, not only on his work in WONDER STORIES, but also in EVERYDAY SCIENCE AND MECHANICS.

The stories, in my estimation, rate as follows:

"Exiles of the Moon": The very best. Schachner and Zagat are exceptionally good.

"Tetrahedra of Space": A close second. Young Miller is very good on story ideas and writes in a clear and concise manner. His story is radically different, yet so well told that it does not seem at all impossible.

"The Superman of Dr. Jukes": A good story idea. Mr. Flagg has told his story well but I believe the readers of this magazine are too intelligent to fully enjoy gangster plots. It is, of course, hard to dictate what is to go into a story. The author has kept the gangsters well in the background and has kept Dr. Jukes' discovery well in mind throughout the story.

"Emperors of Space": Fairly good. The plot is a bit hazy in some places, but it is quite interesting and finishes cleverly. Let's have another by Gross and Penny; they have the ability to write a very interesting story.

"Beyond the Singing Flame": Quite good story idea. Our friend Smith is one of the very few who should not use his dictionary so much. His story could have been as well told in fewer words, and in words which are in more common

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THE READER SPEAKS

usage. It would have been more interesting had I read the "City of the Singing Flame' which, I regret to say, I have not.

All things considered, the stories are excellent and are improving with each issue.

Oh, yes! And you may put me down as being fully in favor of Science Fiction Movies. I shall "support them loyally and urge my friends to do likewise."

Edward R. Gould,
32 No. Central Ave.,
Medford, Ore.

(Is there anything to be desired, Mr. Gould? Or does WONDER STORIES now meet your heart's wishes? We have tried to make this magazine the best in its field. If there is anything it still lacks we would like to know of it.—*Editor.)*

Can Lift Its Head Unashamed

Editor WONDER STORIES:

May I extend sincere congratulations to the supreme magazine on the eve of its greatest advancement? In publishing the magazine on smooth paper and in a larger size, I feel you have done a real service to all true lovers of science fiction. We have now, certainly, a magazine to be proud of, one that can lift its head unashamed among the first-class journals of the day—the foremost exponent of a new branch of literature.

The November issue of WONDER STORIES sets a high-water mark in the publication of fantastic fiction; nearly every story was perfect. The issue, in my estimation should be ranked thus:

First, the editorial, "Wonders of the Stars." The far-reaching scope of Mr. Gernsback's knowledge is to me an astounding thing; I have read nearly every editorial he has written, yet always he has something new, valuable, and amazing to say. How *does* he do it?

Second, "Exiles of the Moon"—Schachner and Zagat are an unequalled team of writers, and this serial seems to me their very best work so far.

I eagerly await more from these talented pens.

Third, "The Superman of Dr. Jukes"—this story is remarkable, not for the idea since that has been used often before—by Wells among others—but for the flawless style and smooth movement of the narrative-action. This man Flagg is a short story artist.

Fourth, "Tetrahedra of Space"—Miller has come very close here to the perfect story: description, dialogue, and action are skillfully blended by P. Schuyler into a smoothly-finished whole. Remarkable writing, Mr. Miller!

Fifth, "Beyond the Singing Flame"—one of Smith's best so far, but somehow disappointing. He has done better: witness "The Amazing Planet" and "Marooned in Andromeda."

Sixth, "Emperors of Space"—this one gave me a pleasant surprise; I had not looked for such exceptionally good work from comparatively unknown writers—but Messrs, Jerome and Gross deserve an encouraging pat on the back for an entertaining action yarn.

Seventh, the Prize Winning Letters—I certainly got an enjoyable thrill out of seeing my name listed among the winners; but I suppose accidents *will* happen!

If you're going to surpass this issue in future numbers of "our" magazine, Mr. Editor, I'd say you'll be travelling some! It was *good!*

And now about the Movies—you'll find enclosed with this lengthy epistle a number of names written on blanks typed by myself, since I didn't want to mar valuable copies of the magazine. Here's hoping that the celluloid venture is to meet with success!

Frank K. Kelly,
2933 Paseo,
Kansas City, Mo.

(We did not think that the November issue was to be one that could not be surpassed. As a matter of fact, we have stories that we believe will prove to be superior, on the whole, to those that we have already published. But we are glad to know that we have set a high mark to aim at.

We want to thank Mr. Kelly for his work in getting so many signatures to the motion picture petition. Although a flood of signatures are coming in, we are slightly disappointed. Not enough of the science fiction lovers are putting their shoulders to this undertaking. We want the petition to contain *tens of thousands of names.* Our readers who do not want to mar their copies by clipping the coupon can receive some printed forms by writing us.—*Editor.)*

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The Super Magazine Classifier

Editor WONDER STORIES:

I have before me, my latest invention the "Super Magazine Classifier." I am about to make the final test, and at hand I have the November issue of WONDER STORIES.

I place the magazine between two rollers and turn on the switch. There is a slight vibration from within the cabinet, as the rollers start pulling the magazine inside. Slowly, sensitive micrometers feel each page to detect the least flaw. An electric eye registers the amount of reflection. A little later two metal arms reach out and grab the magazine and try to tear it apart with a given amount of power. Later it goes through several other tests such as flexibility, evenness of edges, etc. At last Mr. WONDER STORIES jumps out and a relay switch snaps shut. Out of a slot comes a slip of paper that reads, "WONDER STORIES IS 99.9999999999 % PERFECT."

Now we all know that my machine is the bunk as the November issue of WONDER STORIES was 100% perfect. The only theory I have to submit was that there was no story in it by Jack Williamson. On second thought the machine might have been so far advanced that it had the WONDER STORIES QUARTERLY in mind, as you know it has not got the better grade paper, and Paul does not do all of the illustrations.

If the editors or any of the readers have any idea as to where the "off-calculations" were made I would like to know. Until then I shall work long hours on it.

Edward Anderson,
123 Hollister Ave.,
Ocean Park, California.

(Mr. Anderson is in error on one point. Paul is now doing all of the illustrations for the WONDER STORIES QUARTERLY as well as the monthly. We would be interested to receive blueprints of Mr. Anderson's invention, so that we can construct from it a "super story classifier." Then we will never make mistakes in "picking them."—*Editor.)*

We are Moving

Editor WONDER STORIES.

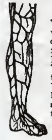
To my mind a method of traversing the time-plane has never been discovered. In making this statement I have used the word "has." You might say that I should have said, "will be discovered."

As a matter of fact I am considering time as an ever-present entity. My conception of this puzzling entity is comparable to a great railroad spread out across the terrain with the tracks representing the path of time, and the ties representing the progressive phases or ages of time. Like the railroad, time is always present, always existent. And always are we progressing along the path, the railroad of time. It is we then who are moving through time, not time that is moving and carrying us with it.

Hence my use of the tense 'has." That gives

(Continued on page 1004)

HEALS LEG SORES



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THE READER SPEAKS

(Continued from page 1003)

us the knowledge that time is present while we travel from our present time to the next.

Also if a time machine had been discovered in some future time, why has it not visited us? Or why has no time machine visited an earlier age? and left the imprint of its knowledge there? If a time machine had materialized at the year 1500 would not the record of such a strange visitation be left for posterity in legendary form?

However, the knowledge of their improbability detracts not the least from their fascination of time travelling stories.

Louis C. Smith,
1908-98th Ave.,
Oakland, Cal.

(Suppose that a person from the year 2000 had taken a trip into time and landed in Europe during the middle ages. He might have flown about in a plane of some kind, he might have possessed electrical instruments and other mechanical wonders to amaze the good people of that time. If he were successful in avoiding the stake on a charge of witchcraft, he would probably have been driven out, and have left behind him a story of his witcheries. The legends of all peoples have stories that may be the result of some such visitation. However, Mr. Smith presents some interesting thoughts for our cogitation.—*Editor.)*

Victor Hugo Might Have Written It

Editor WONDER STORIES:

The November number of your magazine is the most entertaining and thought provoking one I have read. I am hungriest for the scientific data, but the fiction is real food itself.

I especially like "The Exiles of the Moon," by Nathan Schachner and A. L. Zagat, and "Beyond the Singing Flame," by Clark Ashton Smith. This latter story suggests and seems to confirm some convictions that came to me in early childhood and still remain with me—the limitless power of our sense perceptions, "joy . . . . . eternal and unthreatened," and the possibility of flying without wings or mechanical contrivances.

But best of all your writers I still enjoy Francis Flagg. His stories all seem touched with the warmth of human sympathy and fellowship; one is never hopeless of God or man after reading them. In this latest, "The Superman of Dr. Jukes," he has done the finest of his facile pen; and the ending, the old Mexican woman and her "son" come back to her from the grave, is nothing less than great—Victor Hugo might have written it. I am still shaken with the sheer beauty of it, not alone the conception, but the simple, relentless power of its phrasing. Even if I should sometimes be hungry I shall always have to buy WONDER STORIES lest I miss one of his tales.

L. R. Kessler,
553 Natoma St.,
San Francisco, Calif.

(Mr. Kessler points out one of the excellent possibilities of a science story, in his reference to the ending of "The Superman of Dr. Jukes." Because science stories deal with the "unusual" they give writers opportunities to achieve beautiful and original effects in their stories. And men like Francis Flagg strive for those effects and attain them. Clark Ashton Smith is another who achieves startling pictures and images in his writings. With more and more experience these men and the others who form the growing hand of original thinkers in science fiction, will turn out better and better work for our readers to find delight in.—*Editor.)*

Never Hinges Upon a Love Affair

Editor WONDER STORIES:

The completion of "Exiles of the Moon" leaves me with a sense of disappointment. The story was far from what I expected from Messrs. Schachner and Zagat. Technical errors marred it considerably.

That a person would not necessarily be killed immediately upon being exposed to the cold of space was quite satisfactorily proved by the authors. However, in dealing with the ejection of Dore Swithin from the space ship into the void of interstellar space, one vitally important factor was not taken into account. The factor

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THE READER SPEAKS

in question is the absence of atmospheric pressure in space.

The first result of this lack of pressure would be the violent expulsion of the air in Dore's lungs. The pressure of some fourteen and six-tenths pounds per square inch within Swithin's lungs would suffice to force out every vestige of air. Not until the pressure within were equal to the pressure without would the flow of air from Dore's lungs cease. By that time, which would be a few seconds after his ejection from the space ship, his lungs would be completely evacuated. It is very doubtful whether any person could live for four minutes in the complete absence of oxygen as Dore supposedly did.

Other effects of the lack of pressure would be the bursting of Dore's eardrums, breaking of capillaries all over the outer surface of the body, etc. Persons who ascend in airplanes or balloons to altitudes where the atmospheric pressure is one-half to two-thirds the pressure at sea level often suffer from these discomforts. What, then, would be the effects of a total lack of pressure upon a person? Yet Swithin escaped all these misfortunes quite miraculously.

Another fault of the story was the repetition of the plot by the same authors. The same idea, with variations, was employed in "In 20,000 A. D." In both cases the enslaved masses (the Robots in the 20,000 A. D. stories and the Workers in the present serial) rebel against the ruling few (the Masters and the Aristos respectively). In both instances one of the ruling class aids the masses in their struggle (Master Karet and Naomi). Such repetition is undesirable and should be prohibited by the editors.

Yet, as a whole, the story was not poor, exemplifying as it does the old adage that two heads are better than one. Its main redeeming feature was the subjugation of the love interest. These authors are to be praised for the fact that their work never hinges upon a love affair, that they never attempt to promote the plot entirely upon a love basis. Love is the curse of science fiction and I am its avowed enemy. For this reason I hope that Schachner and Zagat will present another serial, maintaining the same high standards, in the near future.

In passing may I state that the editorial pencil should have expunged the sentence on page 773 of "Emperors of Space" wherein the authors speak of "the clear air of the moon"? Such errors are disconcerting and detract from the value of the story.

In closing I'd like to say that if anyone wishes to discuss with me any subject connected or not connected with science fiction, I shall welcome his or her letter.

Milton Kaletsky,
2301 Morris Ave., N. Y.

(It is naturally impossible to tell just what the effect of complete airlessness would be upon a human being. As Mr. Kaletsky says, we do know the effect of rarefied air upon mountain explorers.

As we understood it, Messrs. Schachner and Zagat used the device of the rescue in space simply in order to show up the fallacy of instant death by cold. Now in order to portray that idea forcibly it was really necessary that the rescued man live. For if he didn't live, it would have been impossible to tell what he had died from.

However we would be glad to print other letters dealing with this very interesting question. As we understand it, the American Interplanetary Society is about to undertake a series of experiments dealing with the effect of airlessness and weightlessness upon mice, in order to determine the possible effect upon men.—*Editor.*)

Ending Could Have Been Better

Editor WONDER STORIES:

Once again WONDER STORIES is my favorite magazine. The recent changes you have made brought that about. Keep up the good work.

The December issue had a fine collection of stories.

"The Reign of the Robots" is my choice for first place. I hope that Mr. Hamilton will write more for you.

There is something different about John Taine's stories that put them in a class by themselves. "The Time Stream" is a great serial.

(Continued on page 1006)

Big News!

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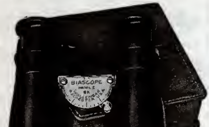

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THE READER SPEAKS

(Continued from page 1005)

"The *Andromeda* Menace" by J. F. Houghton is an interplanetary tale unique. "The Terror From the Sea" I found fascinating. "Lord of the Lightning" and "The World of the Red Sun" were both good, although the ending in the latter could have been better.

Paul's illustrations, by the way, were great.

Many of your readers have asked for reprints. I would like to see some novels from the earlier issues of Mr. Gernsback's magazines reprinted in WONDER STORIES QUARTERLY. I am sure that they would be welcomed by the majority of your readers.

Now that you have smooth paper why don't you publish photos of authors instead of drawings?

Jack Darrow,
4225 N. Spaulding Ave.,
Chicago, Ill.

(Admittedly the ending to "The World of the Red Sun" was not happy, but "that's the way life is." Furthermore, the ending, we suspect, was arranged so that a sequel might be more easily added on. We are going to find out about that sequel.—*Editor.)*

BOOK REVIEW

SNAKES OF THE WORLD by Raymond L. Ditmars, Litt. D. 207 pages, 84 plates. Stiff cloth covers. Size 7½ by 10¼. Published by The Macmillan Company, New York. Price $6.00.

Dr. Ditmars who is the Curator of the Bronx Zoological Gardens is perhaps one of the most eminent authorities on animal life of the day. His book is not only an authoritative account of snake life, but also a fascinating introduction to that reptile for whom human beings have such proverbial fear.

Many of the incredible stories told of the damage done by snakes such as the eating of large cattle by the boas and pythons are exploded by the author. As Dr. Ditmars indicates, the snakes are not interested in such large prey, and are frequently afraid of them.

He does tell, with great interest, that in many sections of the world the snake is a positive blessing. As a prey upon the ground gopher in the wheat growing areas, the snake helps man considerably, and wheat farmers often breed them to get rid of the gopher.

The 84 excellent photographs of various types of snakes serve to illustrate vividly the different forms that the genus takes. It is a pity, however, that the photos could not be spread throughout the text instead of being segregated in the back of the book. The text, however, is well worth the perusal of any nature lover.

STEPS IN THE DARK by Milton Mayer and John Howe. 227 pages, illustrated, stiff cloth covers. Size 6¼x9¼. Published by Thomas S. Rockwell Company, Chicago. Price $2.50.

This book carries on the tradition established by Edwin E. Slosson, of presenting in a popular way scientific developments of the day and their significance.

Taking some three dozen inventions and discoveries in the field of the physical, biological, and social sciences, the authors have endeavored to explain their significance to the layman, and show how in every field of experimental activities, investigators are patiently "moving in the dark" to uncover new truths.

The range of subjects covers such widely separated topics as "Weighing Human Souls," "Diagnosing A Railroad Whistle," what "Mice Tell Us About Cancer," "Is The Family Doomed?", "Transplanting Eyes," and "Finding the Ninth Planet."

For keeping abreast of scientific developments this book should be read.

THE BIOGRAPHY OF MOTHER EARTH by Henry Smith Williams. 315 pages, illustrated. Size 6½ x 9¾. Published by Robert M. McBride & Co., New York. Price $5.00.

Dr. Williams is a writer, not only of marvelous versatility, but possessed of a mind that is always brilliant and stimulating. He has written of perhaps every science, and to each he contributed some clarifying and original thoughts of his own.

The present volume is an attempt to explain how the present continents were formed and what their probable destiny is. Basing his theme upon the Wegener theory of continental displacement, Dr. Williams attempts to show that in the early youth of the earth there was but one continent, Antarctica. By the necessity of preserving the balance of masses of the earth, Antarctica gradually broke up into three land masses. Holarctica which became North America, Europe and part of Asia; Gondwana which later broke up into Africa, South America, Australia and the remainder of Asia; and the present Antarctica.

Gradually moving northward these great land masses finally reached their present positions. Such unexplainable facts as the presence of closely related animal life in widely separated places, the fact that coal deposits are found in Greenland (presuming a long period of tropical climate) are utilized by Williams to gain credence for the Wegener hypothesis. The book is so fascinating that it escapes from the sober classification of "scientific exposition" and does become as the author calls it, a biography. It is recommended cordially.

WINGS FOR MEN by Frank Wead. 330 pages, stiff cloth covers, illustrated. Size 6x9. Published by The Century Company, New York. Price $4.00

This book may be added to the long list of histories of aviation. Like its many predecessors it traces the early beginnings of man's attempts to fly, his failures and discouragements, and the gradual evolution of lighter-than-air and heavier-than-air flying machines.

The book is brought up to date, even to the inclusion in a summary fashion of the Post-Gatty "Round the World" flight in the summer of 1931.

Of chief interest to the reviewer was the brief history of the part that aircraft played in the Great War, and a prediction of the part it is likely to play in future conflicts. The book is well worth reading for those who have not yet had an opportunity to acquaint themselves with the story of man's conquest of the air.

THE NEW BELIEVE IT OR NOT! by Ripley. 200 pages, stiff cloth covers, illustrated. Size 6¼x9¾. Published by Simon and Schuster, New York. Price $2.00

The second series of Ripley's amazing collection of freaks of human behavior and attainments, shows both a maturing of his marvelous power of searching out oddities, and a certain dropping of his high standard. The second series is based upon material Ripley gathered in a trip around the world during which he visited no less than 122 countries. It is a pity that in the remarkable facts that he has collected he should have filled up page after page with silly arithmetical puzzles, long known to the race.

Among those curios of history that should interest the scientifically inclined is the account of the death by freezing of 20 people beneath a brilliant tropical African sky in 1908; the story of the man who reads with his tongue; the fact that snakes have hips; an account of a strange suicide; the story quite remarkable, of the hen that lived for seventeen days after its head had been cut off; the cow that had two udders, one on its back, but both giving milk. The book is as fascinating as the first and to those who doubt that we really live in a crazy world, the book is cordially recommended.

PAUL THE FAMOUS ARTIST ALSO *Illustrates*

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PAUL, WONDER STORIES' famous artist, is now illustrating for EVERYDAY SCIENCE AND MECHANICS. For many years Paul's illustrations have been a favorite with our readers and in this new magazine many wonderful scientific events have been featured by this popular artist. Most amazing are these illustrations which we are sure every reader of WONDER STORIES will want to see.

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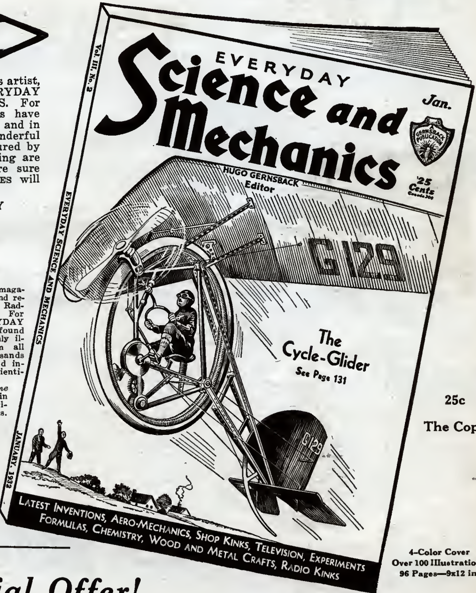
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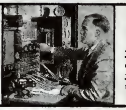

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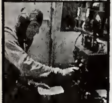

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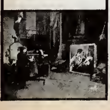

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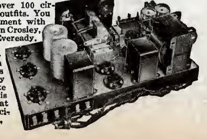

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